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User Guide, Gaseous Emissions Data System

Acurex Corp.
Mountain View, CA

Prepared for

Industrial Environmental Research Lab.
Research Triangle Park, NC

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Environmental Assessment Data Systems

User Guide

Gaseous Emissions Data System

EADS GEDS

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16. ABSTRACT

The report is a user guide to the Gaseous Emissions Data System (GEDS), a computerized data base on gaseous emissions from stationary point sources. GEDS is one of four waste stream data bases which are components of the Environmental Assessment Data Systems (EADS). The EADS concept has been designed to aid researchers in environmental assessment, emissions characterization, and control technology development. GEDS contains data from source sampling which may include: design and typical operating data on control technology applied to the gaseous effluent stream; analysis of any fuel or feedstock to the process producing the effluent stream; results of chemical, physical, radiological, and biological/ecological tests of gaseous samples; process descriptions of the sources; and descriptions of the sampling equipment and techniques employed. The GEDS protocol is consistent with Level 1 and 2 reporting requirements. The guide gives detailed instructions for encoding GEDS data sets, defines procedures for submitting and retrieving data, and contains standard nomenclature to facilitate data encoding. The guide also includes a program library that describes analytical software available to the user and provides instructions for its use. The guide also discusses procedures which will allow its users to access GEDS directly by computer or through the EPA project officer.

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Exhaust Gases	Gaseous Emissions Data System (GEDS)	21B
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R. J. Larkin, Editor

Acurex Corporation
Energy & Environmental Division
485 Clyde Avenue
Mountain View, California 94042

Prepared for
EPA Project Officer — Gary L. Johnson

U.S. Environmental Protection Agency
Office of Research and Development
Industrial Environmental Research Laboratory
Research Triangle Park, NC 27711

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PREFACE

In the course of fulfilling its charter, EPA performs multimedia environmental assessments of stationary sources of pollution and conducts R&D programs to develop and demonstrate feasible control technology. Such programs generate voluminous data, often according to different reporting protocols and sampling and analysis practices. The Environmental Assessment Data Systems (EADS) have been developed to consolidate the results of these programs and others into one comprehensive information system. The EADS is also designed to provide uniformity in reporting protocols and to supply current information and methods for analyzing data.

The EADS is composed of four waste stream data bases and a number of reference and support data bases. The waste stream data bases include the Fine Particle Emissions Information System (FPEIS), the Gaseous Emissions Data System (GEDS), the Liquid Effluents Data System (LEDS), and the Solid Discharge Data System (SDDS). The FPEIS was the original data base in EADS, having become operational in 1977, and is now a mature system containing data from hundreds of stationary sources and serving the needs of a diverse user community. The GEDS, LEDS, and SDDS were initiated in 1978 and are now operational. The original FPEIS has concurrently been redesigned to conform to the requirements of expanded multimedia testing, although existing data in FPEIS will continue to be available to the user.

A complete set of EADS documentation includes six publications -- one User Guide for each of the four waste stream data bases, a Terminology Reference Manual, and a Systems Overview Manual. This document, the GEDS User Guide, gives instructions for the encoding of GEDS data sets and defines procedures for submitting and retrieving data. It also describes available software packages for analysis of GEDS data.

TABLE OF CONTENTS

Section Page

1 INTRODUCTION 1.0-1
2 DATA BASE DESCRIPTION 2.0-1
  2.0 GEDS Structure 2.0-1
  2.1 GEDS Organization and Contents 2.1-1
    2.1.1 Source and Test Series Related Information . . . 2.1-1
    2.1.2 Control Device and Stream Design Conditions . . 2.1-6
    2.1.3 Test Operating Conditions 2.1-6
    2.1.4 Sampling Activity Information 2.1-7
3 DATA ACQUISTION AND ORGANIZATION 3.0-1
  3.0 Introduction 3.0-1
  3.1 How to Build a Test Series 3.1-1
  3.2 Data Input Form Structure 3.2-1
  3.3 Structure Application Example 3.3-1
  3.4 Special Encoding Considerations 3.4-1
    3.4.1 Multimedia Test Series 3.4-1
    3.4.2 Multiple Control Devices 3.4-2
    3.4.3 Parallel or Series Control Devices 3.4-2
    3.4.4 Fuels and Feedstocks 3.4-2
    3.4.5 Data Accuracy and Quality 3.4-4
    3.4.6 Source Assessment Sampling System 3.4-4
    3.4.7 Effluent Characteristics 3.4-7
    3.4.8 Reporting of Chemical Analysis Results 3.4-9
    3.4.9 Reporting of Radionuclide Data 3.4-10
    3.4.10 Bioassay Results 3.4-10
4 ENCODING INSTRUCTIONS FOR GEDS DATA INPUT FORMS 4.0-1
  4.0 General Rules 4.0-1
  4.1 Labor Saving Features 4.1-1
    4.1.1 Repetitive Data Feature 4.1-1
    4.1.2 Control Device and Design Parameters 4.1-4
    4.1.3 Operating Parameter Serial Number 4.1-4
  4.2 Encoding Instructions 4.2-1
5 DATA SUBMITTAL 5.0-1
  5.0 Introduction 5.0-1
  5.1 Data Input Form Processing 5.1-1
  5.2 Submittal Procedures 5.2-1
  5.3 Review and Corrective Action Procedures 5.3-1

TABLE OF CONTENTS (Continued)

Section Page

5.4 EDIT/LOAD Programs 5.4-1

5.4.1 EDIT Program 5.4-1
5.4.2 LOAD Program 5.4-3

6 DATA RETRIEVAL 6.0-1

6.0 Introduction 6.0-1
6.1 Data Retrieval Using the Program Library 6.1-1
6.2 Special Data Retrieval Requests 6.2-1
6.3 Key/Non-key Data Elements 6.3-1
6.4 On-Line Request Procedures 6.4-1
6.5 NCC User Qualifications and Services Registration 6.5-1

6.5.1 Registration Procedures 6.5-1
6.5.2 User ID and Password 6.5-5

6.6 Interactive Terminal Operation 6.6-1

6.6.1 Initiating a Demand Processing Session 6.6-4
6.6.2 Terminating a Demand Processing Session 6.6-8
6.6.3 Accessing the EADS 6.6-9

6.7 Remote Batch Terminal Operation 6.7-1

6.7.1 Initiating a Remote Batch Processing Session . . 6.7-3
6.7.2 Terminating a Remote Batch Processing Session 6.7-3

6.8 EADS User Support 6.8-1

7 PROGRAM LIBRARY 7.0-1

7.0 Introduction 7.0-1
7.1 SERIES Report 7.1-1

7.1.1 Applicability 7.1-1
7.1.2 Abstract 7.1-1
7.1.3 User Data Required 7.1-2
7.1.4 Data Qualification Required 7.1-2
7.1.5 Limitations/Restrictions 7.1-2
7.1.6 Functional Description 7.1-2
7.1.7 User Instructions -- Demand 7.1-2
7.1.8 User Instructions -- Batch 7.1-4
7.1.9 Sample Demand Runs 7.1-5
7.1.10 Sample SERIES Report 7.1-5

TABLE OF CONTENTS (Continued)

Section Page

7.2 Chemical Search Program (CHEM-SEARCH) 7.2-1

7.2.1 Applicability 7.2-1
7.2.2 Abstract 7.2-1
7.2.3 User Data Required 7.2-2
7.2.4 Data Qualification Required 7.2-2
7.2.5 Limitations/Restrictions 7.2-2
7.2.6 Functional Description 7.2-2
7.2.7 User Instructions -- Demand 7.2-2
7.2.8 User Instructions -- Batch 7.2-5
7.2.9 Sample Demand Runs 7.2-7
7.2.10 Sample Batch Runs 7.2-13

7.3 Series Summary Information Program (SNAP-SHOT) . . 7.3-1

7.3.1 Applicability 7.3-1
7.3.2 Abstract 7.3-1
7.3.3 User Data Required 7.3-2
7.3.4 Data Qualification Required 7.3-3
7.3.5 Limitations/Restrictions 7.3-3
7.3.6 Functional Description 7.3-3
7.3.7 User Instructions -- Demand 7.3-3
7.3.8 User Instructions -- Batch 7.3-6
7.3.9 Sample Demand Runs 7.3-8
7.3.10 Sample Batch Runs 7.3-9
7.3.11 Sample Output 7.3-9

7.4 Biological Search Program (BIO-SEARCH) 7.4-1

7.4.1 Applicability 7.4-1
7.4.2 Abstract 7.4-1
7.4.3 User Data Required 7.4-1
7.4.4 Data Qualification Required 7.4-2
7.4.5 Limitations/Restrictions 7.4-2
7.4.6 Functional Description 7.4-2
7.4.7 User Instructions -- Demand 7.4-2
7.4.8 User Instructions -- Batch 7.4-4
7.4.9 Sample Demand Runs 7.4-6
7.4.10 Sample Batch Runs 7.4-9

7.5 Radiological Search Program (RAD-SEARCH) 7.5-1

7.5.1 Applicability 7.5-1
7.5.2 Abstract 7.5-1
7.5.3 User Data Required 7.5-1
7.5.4 Data Qualification Required 7.5-1
7.5.5 Limitations/Restrictions 7.5-2
7.5.6 Functional Description 7.5-2
7.5.7 User Instructions -- Demand 7.5-2

TABLE OF CONTENTS (Concluded)

Section Page

7.5.8 User Instructions -- Batch 7.5-4
7.5.9 Sample Demand Runs 7.5-6
7.5.10 Sample Batch Runs 7.5-8

7.6 Control Technology Search Program (CONTROL-SEARCH) 7.6-1

7.6.1 Applicability 7.6-1
7.6.2 Abstract 7.6-1
7.6.3 User Data Required 7.6-1
7.6.4 Data Qualification Required 7.6-1
7.6.5 Limitations/Restrictions 7.6-2
7.6.6 Functional Description 7.6-2
7.6.7 User Instructions -- Demand 7.6-2
7.6.8 User Instructions -- Batch 7.6-5
7.6.9 Sample Demand Runs 7.6-6
7.6.10 Sample Batch Runs 7.6-10

APPENDIX

LIST OF ILLUSTRATIONS

Figure		Page
2-1	EADS Structure	2.0-5
2-2	Waste Stream Data Base Structure	2.1-4
2-3	Organic Extract Summary Table	2.1-9
3-1	Waste Stream Data Base Structure and Contents	3.1-2
3-2	Forms Ordering	3.2-3
3-3	Data Structure -- Gasification Plant	3.3-3
3-4	Source Assessment Sampling System	3.4-7
4-1	Repetitive Data Feature Structure	4.1-2
5-1	Sample Data Submittal Letter	5.2-2
5-2	Sample Data Submittal Acknowledgement Letter	5.2-3
5-3	QA Procedure	5.3-2
5-4	Sample EDIT Output	5.4-4
6-1	NCC Application	6.5-2
6-2	Request for Batch Terminal Support Form	6.7-2

LIST OF TABLES

Table		Page
2-1	GEDS Data Elements and Their Levels	2.1-2
3-1	Source Sampling Log -- Gasification Plant	3.3-2
3-2	Response Ranges for Ranking of Various Biotests	3.4-12
4-1	Engineering Units	4.2-33
4-2	Conversion Factors to Metric Units	4.2-35
6-1	List of Key Data Elements	6.3-2
6-2	Remote Interface Control Statements	6.6-5
6-3	NCC Demand Access Telephone Numbers	6.6-7
6-4	NCC Remote Batch Access Telephone Numbers	6.7-4

CONTACTS

EADS Program Manager	Gary L. Johnson (MD-63) Industrial Environmental Research Laboratory U.S. Environmental Protection Agency Research Triangle Park, North Carolina 27711 919-541-2745
EADS Technical Staff	
Gaseous Emissions Data System, Liquid Effluents Data System	Barbara S. Ballard Acurex Corporation 485 Clyde Avenue Mountain View, California 94042 415-964-3200, Extension 3019 or Robert J. Larkin Acurex Corporation 485 Clyde Avenue Mountain View, California 94042 415-964-3200, Extension 3019
Fine Particle Emissions Information System, Solid Discharge Data System	J. Patrick Reider Midwest Research Institute 425 Volker Boulevard Kansas City, Missouri 64110 816-753-7600
Software	Nick Young Acurex Corporation Route 1, Box 423 Morrisville, North Carolina 27560 919-781-9704

SECTION 1

INTRODUCTION

The Environmental Assessment Data Systems (EADS) are a group of independent computerized data bases which are interlinked to provide common accessibility to data produced by a variety of EPA projects. EPA-IERL/RTP's Environmental Assessment (EA) programs are expected to be heavy contributors and users. Accordingly, the EADS has been structured in a manner such that EA data can easily be transferred to the input forms. However, the structure is flexible and comprehensive enough so that data from virtually any pollutant sampling and analysis protocol could be included. The EADS is intended to accept data from either energy systems or industrial processes. Often times these data are multimedia in nature. Emissions could be fine particles, gases, liquids, solids, or any combination all coming from the same industrial source. Because pollution controls are developed on a media-by-media and pollutant-by-pollutant basis, EADS is composed of media-specific data base systems. They are the Fine Particle Emissions Information System (FPEIS), the Gaseous Emissions Data System (GEDS), the Liquid Effluents Data System (LEDS), and the Solid Discharge Data System (SDDS). This User Guide will instruct in the use of the GEDS. There are companion User Guides for the other data bases (FPEIS User Guide, EPA 600/8-80-007, January 1980; LEDS User Guide, EPA 600/8-80-008, January 1980; SDDS User Guide, EPA-600/8-80-009, January 1980).

While independent, the four data bases are very similar in structure and are interlinked. Interlinking is necessary to enable a control strategy analyst or an R&D program planner to select the most environmentally acceptable control methods on a systems basis. When one considers the objectives and scope of today's investigative and iterative environmental studies, it is easy to see why interlinking is necessary. Environmental Assessments, for example, are intended to determine comprehensive multimedia environmental loadings and compare them to existing emissions and ambient standards. Resulting health, ecological and environmental effects, and cross-media impacts and trade-offs are also assessed. It is necessary and useful to examine and compare emissions across all media from a specific source.

For example, to evaluate the total environmental impact of a flue gas scrubber installation on a coal-fired boiler, you would need to sample and analyze a variety of effluent streams from different media. Among these might be the boiler bottom ash, the flue gas into and out of the scrubber, and the liquid slurry produced from the scrubber treatment of the flue gas. These would be solid, gaseous and liquid effluents, respectively, all from one source. The EADS (FPEIS, GEDS, LEDS, and SDDS) is designed to characterize these emissions by providing data on the factors affecting their generation, modification, sampling, measurement, and analysis. The data base system is designed so that one can encode and retrieve information regarding a specific test, a specific source, a specific control device or treatment process, and a specific pollutant, as well as a large array of other data elements that may be of interest to the user.

The EADS can accommodate partial data. The number of parameters measured in a test depends upon the objectives of the testing program. It is possible that certain source tests will not have all the data which the EADS is designed to contain, nor is the EADS intended to suggest or dictate the details of a test program. For example, in a given testing program, all the tests may be made at only the inlet or outlet, and the chemical analysis or bioassay results may or may not be conducted. It is also likely that some of the control technology design and operating parameters may not be reported. Even if there are missing data, the available data will be of use and should be reported.

Reading this manual may suggest that EADS is bound, even constricted, by numerous operational rules. In any computerized system there must be rules; once understood, they facilitate the job of data encoding. It must be stressed, nevertheless, that flexibility has been built into EADS. This will be shown in succeeding sections of this User Guide.

Data from sources or sites for which the company name, location, etc., are or should remain confidential can also be accommodated. The encoding of data from confidential sources is discussed in Section 4 of this User Guide and the EADS Systems Overview Manual (EPA-600/8-80-005, January 1980).

The GEDS system contains industrial or energy process source emissions test data and related source and control system design and operating data. It attempts to comprehensively describe the gaseous emissions at the point from which the gaseous sample is collected from the gas stream. General groups or categories of information include source characteristics, discharge stream characteristics, control device or treatment process information, process conditions, test information, analyses of the fuels and feedstocks, sampling activity information, inorganic and organic chemical analyses, radionuclide analyses, and bioassay results. Each group of information includes a number of related data elements, each of which is a unique variable essential for the description of the source tested.

A uniform protocol for units and terminology has been developed along with standard data input forms, output report formats and analytical software. Each data element in the system has been defined in detail for clarity. These standards and definitions will allow all data in the system to be stored or retrieved on a common basis.

The GEDS has been implemented at the Environmental Protection Agency (EPA) National Computer Center (NCC) at Research Triangle Park, on the UNIVAC 1100 computer, using SYSTEM 2000®. SYSTEM 2000® is a data base management system developed by the Commercial Systems Division of INTEL, Inc. It will provide users with a virtually unlimited potential for data analysis. Features of SYSTEM 2000® include sorting, comparing, and retrieving information from the GEDS data base in a variety of arrangements.

There are two companion documents to the GEDS User Guide: the EADS Systems Overview Manual (EPA-600/8-80-005, January 1980) and the EADS Terminology Reference Manual (EPA-600/8-80-011, February 1980). A complete set of EADS documentation would include User Guides for the liquid, fine particle and solid discharge data bases (LEDS, FPEIS and SDDS, respectively) as well. The EADS Systems Overview Manual contains a broad-based description of the purposes and scope of the EADS, a discussion of its organization, and descriptions of the EADS reference data bases and user software. The EADS Terminology Reference Manual is a general reference manual on the terminology used to enter and retrieve information from the EADS waste stream data bases. These manuals are designed with discrete segments for major sections and subsections. As changes, additions, and expansions of the system and the informational capabilities are made, the manuals will be updated as appropriate.

Section 2 describes the structure, organization and contents of the GEDS. Section 3 demonstrates an application of a sampling activity to the GEDS structure and how data should be organized for an encoding effort. Encoding instructions are given in Section 4. Section 5 describes procedures required after data has been encoded and is being submitted for inclusion in the GEDS. Section 6 describes the steps for on- and off-line data retrievals. User output analysis packages are enumerated in Section 7 -- Program Library. Users should become thoroughly familiar with the contents of this document before attempting to encode data.

SECTION 2

DATA BASE DESCRIPTION

2.0 GEDS STRUCTURE

The discussion in this section is intended to introduce the new EADS user to the data base. The main objective is to familiarize the user with the fundamental structural components of the data base and how they are assembled to form a structural hierarchy. While this User Guide is for GEDS only, the user should realize that each of the four data bases that comprise EADS (GEDS, FPEIS, LEDS and SDDS) are structured in an identical manner. Naturally, though, certain data elements will be specific to one media only. Consequently there will be detail differences between data bases, but not structural differences.

The structure of the GEDS data base presents and organizes a comprehensive set of data which describes the conduct, techniques, conditions and results of stationary source emission sampling and analysis activities. Each variable or bit of data or information concerning the source test is defined as a data element. The completeness of information for any given source test within the data base is limited only by the completeness of the test report or original test data from which the GEDS input was derived.

Before continuing on in this section, the user should become familiar with certain terms used throughout the EADS documents. These terms form the structure upon which all of the EADS waste stream data bases are based. Many of the terms will probably be familiar, but others such as "test" may, in the context of EADS, have definitions that are slightly different from the typical definition. In order to maintain the integrity of the EADS data, it is imperative that these definitions are understood and properly used.

media -- Used in reference to an effluent stream from a stationary source. May be either fine particle, gaseous, liquid, or solid.

source -- A source may be either an industrial or energy conversion facility. It is the origin of one or more multimedia effluent streams. An oil refinery and a coal-fired powerplant would each be examples of a source.

stream -- Any multimedia effluent discharging to the environment from a stationary source.

control device/treatment process -- A device or process designed to remove a specific pollutant or pollutants from an effluent stream.

control system -- Frequently a discharge stream is controlled by a number of control devices which may be in either a series or parallel arrangement. The total group of control devices on that stream is referred to as the control system.

level -- A data base structural term used to differentiate groupings of data within the data base. The EADS contains four structural levels: the test series level, the stream design level, the test operating level, and the sample level.

test series -- Taken in its broadest context, a test series designates the sampling activities performed at a single source over a specified period of time (usually continuous) with a specific control system employed.

test -- A set of various types of samples taken to characterize a source waste stream(s) under one set of source and control device/treatment process operating conditions.

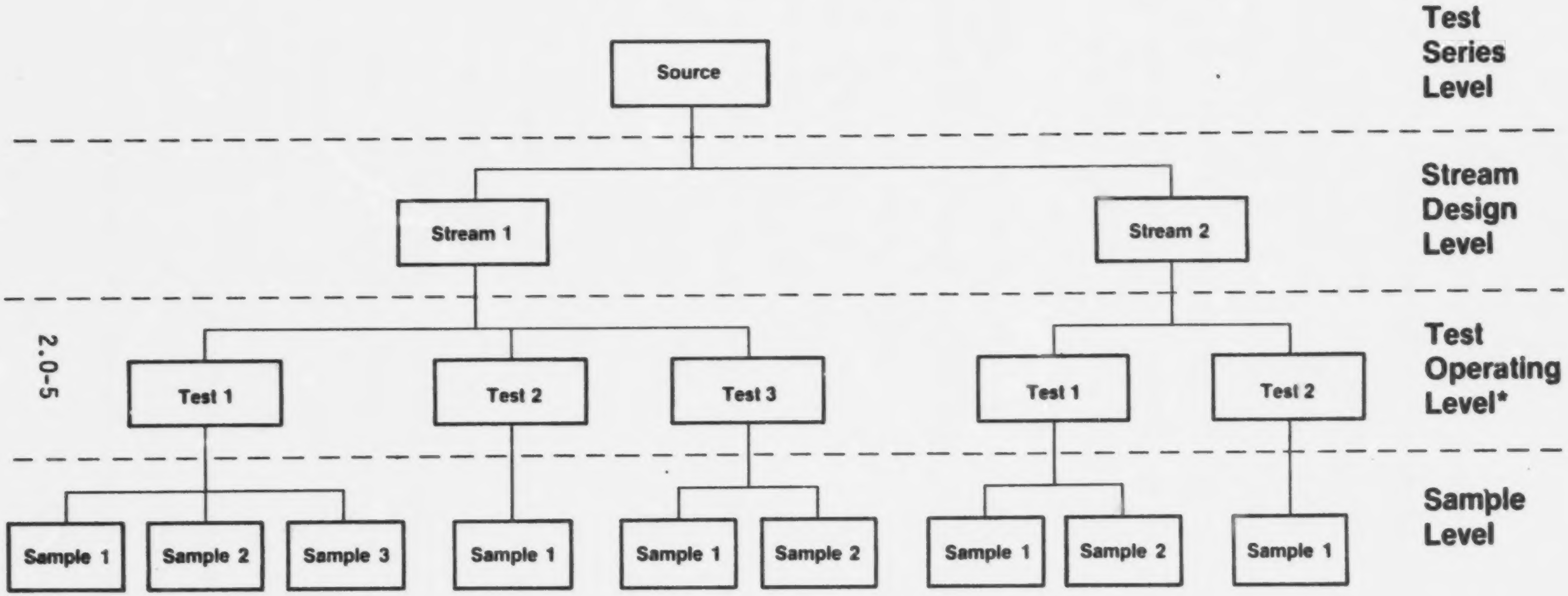
sample -- The measurement or group of measurements taken with a single measurement method or instrument to describe the composition of a stream at a given point in time and at a specific location.

component -- Frequently a measurement instrument can be separated into two or more components, each of which contains a sample which may be analyzed separately or combined. For example, an EPA Method 8 train will collect one sample (in the EADS context) which can be divided into two components. The probe, filter, and first impinger contents would be defined as one component and be analyzed for sulfuric acid mist. The contents of the second and third impingers would constitute the second component and be separately analyzed for sulfur dioxide.

Several data elements or information items are required to adequately describe the groups of information which are contained within the GEDS. These groups are discussed in the EADS Systems Overview Manual and in greater detail in this section. Also, the reader may wish to refer to the Data Base Definition (a computer listing of all data elements) and the Data Base Tree (a graphical presentation of the major groups of information contained in the data base) in Appendix A.2. From an organizational standpoint, the various data elements are grouped in one of four levels: the test series level, the stream design level, the test operating level, and the sample level. These levels and their relationship are shown in Figure 2-1.

The term "test series level" is used to designate the uppermost level in the data base structure. This is where source description data are contained. A single "test series" is composed of all data in the four structural levels, the first of which has been designated the "test series level". A test series designates the sampling activities performed at a single site over a specified period of time (usually continuous) with a specific control system employed. Each test series is assigned a unique Test Series Number (TSN) which can always be used to identify that data. It is possible that certain tests may involve changes to the process which may make the use of multiple test series more appropriate. This is entirely at the discretion of the encoder. The encoder should do whatever seems most convenient and logical. The following examples will illustrate this point.

Suppose a utility boiler is tested under two sets of NO_x control techniques; one technique is called burners-out-of-service and the other, biased burner firing. One test is performed using each control technique individually. The encoder would probably find it most convenient to assign a unique Test ID Number to each test within one test series, rather than


Source
Test Series Level
Stream 1
Stream 2
Stream Design Level
Test 1
Test 2
Test 3
Test 1
Test 2
Test Operating Level*
Sample 1
Sample 2
Sample 3
Sample 1
Sample 1
Sample 2
Sample 1
Sample 2
Sample 1
Sample Level

*Each test could be at a different process (source) operating condition.

Figure 2-1. EADS structure.

assigning each test to a separate test series. Because these two control techniques do not have appreciable design differences, there is no reason to call them different control systems, and thus assign them to different test series. Now suppose a utility boiler is equipped with a pilot scale scrubber which can be altered in the field to become two different generic design types -- a venturi type and a TCA type scrubber. Because design conditions of the control system are now different, it would be more appropriate to assign those control types to two different test series rather than two tests within one test series.

The level following the test series level is the stream design level. Here, each waste stream that has been sampled during the test series is fully described with regard to design parameters. These include control device(s)/treatment process design parameters as well as stream parameters (i.e., flowrate, temperature, pressure, etc.). Being design data, the information at this level will not change within a test series, barring, of course, any physical changes to the process, ductwork, or control device. This is a highly unlikely situation. It is important to keep in mind the meaning of a control device/treatment process. Fine particle, gaseous, and liquid waste streams have control devices to reduce emissions. Examples include ESP's, SO_2 scrubbers, and waste water clarifiers. Solid discharge streams do not, however, have control devices per se. They are "controlled" rather by treatment, storage or recovery processes which in some manner decrease the pollutant burden on the environment. Hence, the terminology, Control Device/Treatment/Storage/ Recovery Process.

Following the stream design level is the test operating level. As the name implies, operating data for each test is defined here. Source operating data, such as operating mode and feed material rate, and control device/treatment process operating data are included. Here also, the fuels and feedstocks to the process are completely characterized. A test is broadly defined as a set of various types of samples (e.g., SASS, impactor, continuous monitor, grab, etc.) taken to characterize a source waste stream(s) under one set of source and control device/treatment process operating conditions. Occasionally engineering judgement needs to be used when, for example, source operating conditions may change during a test. A decision needs to be made regarding the effect of the change on the emissions being tested. If it is deemed an insignificant change then the encoder may designate the test as one test. However, if the source operating change could appreciably alter the quality or quantity of emissions, then the encoder should create multiple tests, one for each source condition and each containing samples taken during that particular operating condition.

The fourth level in the EADS structure is the sample level. All details for each discrete sample taken during a test are contained here. This includes measurement equipment particulars, measured stream conditions at the sampling location, and complete physical, chemical, radionuclide and bioassay analysis data.

This level contains a "component" feature which enables one to report data with respect to a measurement instrument component. For example, the Source Assessment Sampling System (SASS) is a measurement instrument with multiple components that collect different compounds simultaneously. The SASS train is the recommended EPA environmental assessment measurement instrument for gaseous streams which may contain fine particles. Complete detailed information on the SASS can be found in "IERL-RTP Procedures Manual: Level 1 Environmental Assessment (Second Edition)," EPA-600/7-78-201, October 1978. The SASS train has a set of three cyclones followed by a filter which classifies fine particles in a gas stream according to size. Each cyclone and the filter may be analyzed as a separate component or they may be combined and analyzed in some combination, depending on the purpose of the test. Simultaneously, other components collect gaseous organic material and volatile trace elements. Typically, each SASS component is subjected separately to a variety of analyses. EADS is designed to accommodate the data resulting from such an arrangement. Be sure, however, to encode this data in the correct data base. Even though the SASS is one sampling train, it produces data on fine particles and gaseous pollutants. Thus, the fine particle data would be in FPEIS, with the cyclones and filter being the components, and the organic and trace element data collected from the organic module and impinger components would be in GEDS. FPEIS contains fine particle data and GEDS contains gaseous data. While this procedure may seem confusing while encoding data, it will facilitate data output requests.

Looking again at Figure 2-1, it is easy to see the flexibility of the data base structure. Each test series includes information and data from one stationary source in a given time period with one particular source/control system. Each source, however, can contain any number of effluent streams in any media. The data system is capable of accommodating as many gaseous emissions streams as are tested. In the same manner, each stream is likely to be tested a number of times under a variety of source and control device operating conditions. Again, the data system will accommodate information from any number of tests performed on each emissions stream. Frequently an emissions stream is sampled with a variety of measurement methods under each set of source/control operating conditions. The data system will accommodate information from any number of samples obtained during each test on each stream. The EADS will contain many test series each structured in a similar manner.

When making a decision whether or not to submit data to EADS, the user should not let the amount of data enter into his or her decision. EADS will accept a test series of any size, regardless of the number of effluent streams, tests, or samples. The primary decision criteria should be the perceived value or usefulness of the data to the user community. This decision should be a mutual one between the contractor and his project officer. Guidance may also be sought from the EADS technical staff.

2.1 GEDS ORGANIZATION AND CONTENTS

As one can see from the previous discussion, the GEDS data base structure contains four levels. These levels are simply an organizational tool -- enabling the data to be arranged in a manner which is logical from the user's viewpoint. Each level contains specific types or groups of data. Table 2-1 shows the relationship between these general groups of information and the contents in each group, while the data base structure is shown in Figure 2-2. The data are grouped into the following general categories: (a) general source description and related information; (b) design conditions and parameters of the effluent stream and of the control device or treatment/storage/recovery process; (c) test operating information including analyses of any fuels and feedstocks; (d) sampling activity information including chemical, physical, radionuclide, and bioassay analysis results.

2.1.1 Source and Test Series Related Information

This group of data elements identifies the stationary source that was tested, the source location, and the origin of the data which comprise the test series. To enable a general grouping of sources to be made and to facilitate computer searches of particular source types, each source is to be described using appropriate terms from the EADS Source Classification System. The NEDS Source Classification Codes (SCC) were formerly used with the FPEIS, but to enhance flexibility, they have been replaced by the EADS system. The NEDS SCC system had proved to be too cumbersome and archaic and had contained terminology unfamiliar to users of environmental data. The EADS system contains more familiar source terminology and, in addition, contains a reference to the SIC code (Standard Industrial Classification Manual, Executive Office of the President -- Office of

TABLE 2-1. GEDS DATA ELEMENTS AND THEIR LEVELS

Test Series Level	Stream Design Level	Test Operating Level	Sample Level
A. Source Description Source category Source type Product/device type SIC code Process type Design process rate and units Feed material category Source name Site name and address FPEIS, SDDS, and LEDS TSN's Series start and finish dates Sponsor organization Contract number TO/TD number Name of sampling group/contractor Reference title, author, number, publication date, and NTIS number B. Test Series Comments	C. Stream Characteristics (Design) Flowrate and units Velocity Temperature Pressure Moisture content Stack height Stream name Comments D. Control Device or Treatment Process Generic device/process type Design type Specific process/device type Device/process class Commercial name Manufacturer Device/process keywords Design parameters analysis	E. Test Identification Date Start and end times Operating mode Percent design capacity Device operating parameters Comments F. Fuels and Feedstocks Source feed material, feed rate and units Sample mass and units Laboratory name and approval Feed sample volume and units Proximate analysis Ultimate analysis Physical characteristics Inorganic and organic analysis Comments	H. Sampling Activity Description Measurement instrument/method Start time and duration Measured stream: Flowrate Velocity Temperature Pressure Moisture content Sample volume Flowrate measurement method Sample mass and units Sampling location description Collection surface/substrate Comments K. Component of Sampling Measurement Method Component name Component weight Chemical analysis laboratory name Chemical lab approval Radionuclide lab approval Component aliquot mass/volume and units Effluent characteristics Parameter Value and units Analysis method Detection limits Comments L. Inorganic Analysis/Non-Level 1 or 2 Organic Analysis Species Analysis method Detection limits Total milligrams recovered Concentration Comments

TABLE 2-1. Concluded

Test Series Level	Stream Design Level	Test Operating Level	Sample Level
			M. Level 1 or 2 Organic Analysis Fraction ID TCO Grav Species Analysis method Detection limits Intensity Concentration Comments R. Radionuclide Data Radionuclide ID Analytical method Detection limits Concentration Comments T. Bioassay Data Test type Test name Duration Laboratory sample ID Laboratory name and approval Test start and end dates Sample quantity and units Test organism/strains Type of value, value, and units Confidence limits Maximum applicable dose and units Level of toxicity Bacteria mutagenicity response Minimum effective concentration and units Approximate concentration factor Comments

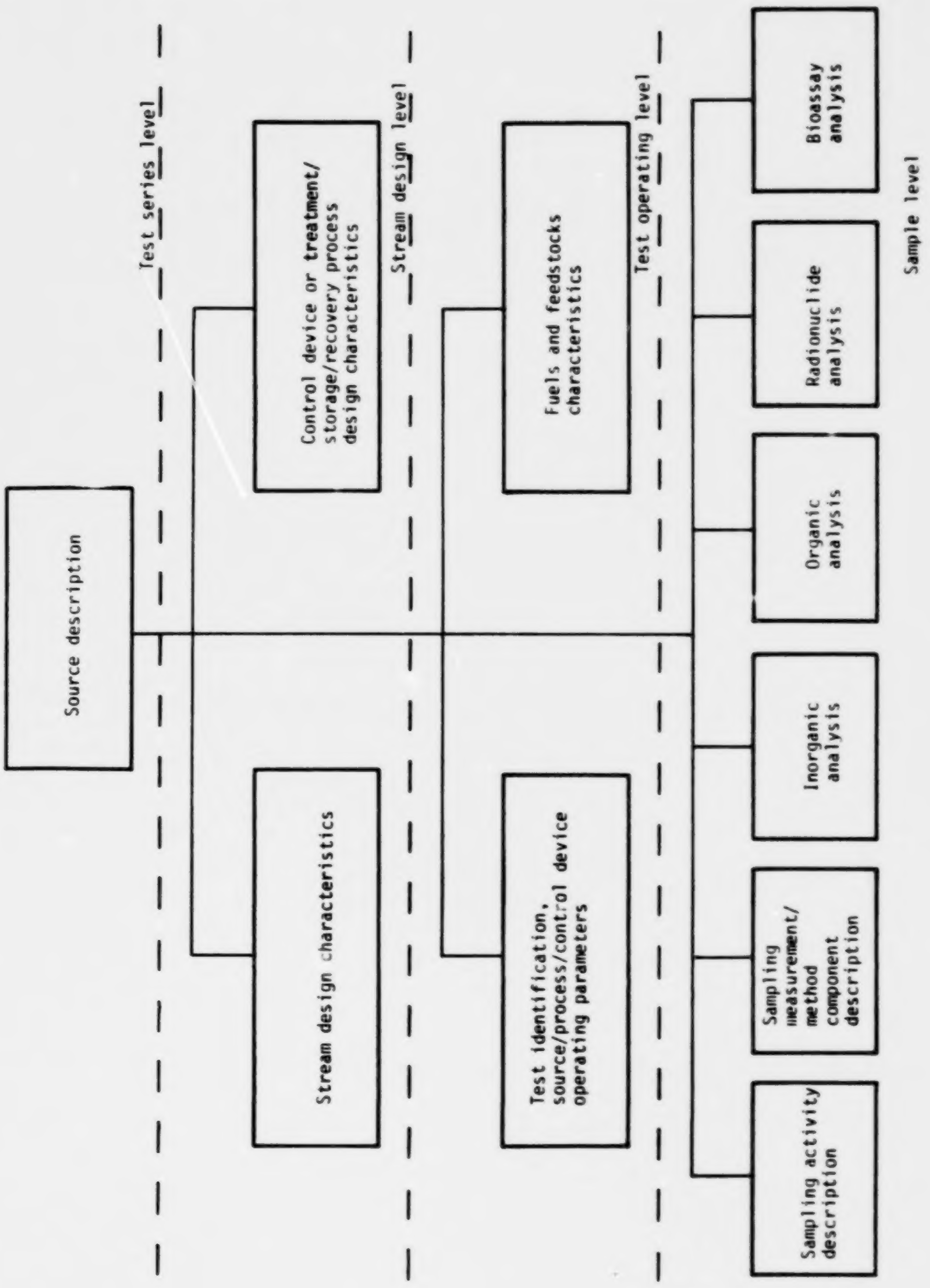

Source description
Test series level
Stream design characteristics
Control device or treatment/storage/recovery process design characteristics
Stream design level
Test identification, source/process/control device operating parameters
Fuels and feedstocks characteristics
Test operating level
Sampling activity description
Sampling measurement/method component description
Inorganic analysis
Organic analysis
Radionuclide analysis
Bioassay analysis
Sample level

Figure 2-2. Waste stream data base structure.

Management and Budget, prepared by the Statistical Policy Division, GPO Stock No. 4101-0066, 1972) for cross-reference to other data systems. The allowable entries for the EADS Source Classification System are listed in the EADS Terminology Reference Manual and use four increasingly specific descriptors to characterize a source.

The name of the testing organization and the reference (report, journal article, etc.) from which the data have been extracted are included. Additionally, comments or data may be included which may be pertinent to the test series, but for which a specific data element is not available.

An important feature of the GEDS is that it can protect confidential or proprietary source data, if the source owners so choose. The GEDS will accept the entry "CONFIDENTIAL" for any source who wishes their identity (i.e., site name and address) to be anonymous. This enables the GEDS to store important gaseous data from sources which would otherwise be unavailable. EPA will have no knowledge whatsoever of the identity of the source. This feature has already been frequently used with the original FPEIS and has been a great aid in obtaining data.

Each of the EADS data bases also contains cross references to other data bases within EADS. For example, suppose a source with multimedia discharge streams is tested and the gaseous emissions data are to be reported in the GEDS. The GEDS test series would then contain cross references (i.e., Test Series Number -- TSN) to test series in the other media, either fine particle, liquid, solid or whichever combination was appropriate, for the same source. In the same manner, test series in the other media would contain a cross reference (TSN) to the GEDS data base.

2.1.2 Control Device and Stream Design Conditions

A description of the design conditions of the gaseous emissions stream at the sampling location is contained within this group. This information may include data elements such as flowrate, temperature and pressure. Because this is design information, the values will not change from test to test, unless of course the control device or stream itself is altered in some manner.

This grouping of data elements contains design information and descriptions of the control system tested (if any) for the test series. Standard nomenclature (see the Terminology Reference Manual) is used to characterize the device or treatment process by generic device type, design type, specific process type, and the device class. If this standard nomenclature is found to be insufficient in describing the control device, the encoder may include keywords to further describe it. Commercial name and manufacturer may also be entered.

Control device/treatment process design parameters are indicated by type and value, where known. A tabulation of suggested minimum specification types is provided as standard nomenclature in the Terminology Reference Manual. The units to be used are also given. The EADS uses SI units throughout, except where noted. A listing of units and useful conversion factors is located at the end of Section 4.

2.1.3 Test Operating Conditions

Data elements in this group describe actual operating conditions, as opposed to design conditions, for the test, source, and control devices. Included here is such information as test dates and times and operating conditions of the source. Control device operating parameters are indicated by type and value, and are described by standard nomenclature with appropriate units also given. As with the design parameters, suggested operating parameters are given for many of the typical gaseous control devices or treatment processes in use today for a variety of sources. The user may define and include additional parameters as required, but should, however, receive approval from the EADS Project Manager beforehand.

This group also contains data describing all fuels and feedstocks that are inputs to the process being sampled. Up to nine separate fuels or feedstock materials may be described for each process waste stream sampled in the test series. The description of the fuel or feedstock includes proximate and ultimate analysis results, physical characteristics, inorganic and organic composition, as well as the rate of consumption of the fuel or feedstock.

2.1.4 Sampling Activity Information

This group of data elements consists of information that describes individual sampling activities, including actual measured gas stream conditions at the sampling location, such as temperature, pressure, and moisture content. In addition the sampling location itself would be described in such a manner that its location with respect to a control device or treatment process would be clear.

Frequently, a measurement instrument contains two or more components, each of which is designed to capture different gaseous species. For example, an EPA Method 8 train is designed to capture both sulfuric acid mist and sulfur dioxide, but in different components of the sampling train. This group of GEDS data describes not only the instrument itself but also each component separately and reports the results obtained from the analysis performed on the sample collected in each component. Chemical, physical, radionuclide, and bioassay results may be reported. Results are typically presented as the identification of the species analyzed and the actual source concentration as contributed by that component.

An important feature of this group is the quality control/quality assurance information on the analytical results. Data elements that provide some measure of quality control and assurance include detection limits of the analytical method, total amount of sample analyzed, sample aliquot, identification of the analytical laboratory and reference to any laboratory quality assurance (QA) audit information. Analytical laboratory audits are routinely performed by government organizations such as the Environmental Protection Agency. The results of such audits can be valuable in assessing the reliability and accuracy of analytical results. The audit information is contained in a separate reference data base which is accessed through a QA/QC code reported in GEDS. More information on the audit data base can be found in the EADS Systems Overview Manual and in Section 3 of this User Guide.

Special provisions have been included to accommodate the organic species reporting protocol of a Level 1 or 2 environmental assessment sampling and analysis program. This analysis protocol includes a group of qualitative and semi-quantitative analytical methods whose results are suggested to be reported in a manner shown in the example in Figure 2-3 (taken from the "IERL/RTP Procedures Manual: Level 1 Environmental Assessment (Second Edition)," EPA-600/7-78-201, October 1978). The GEDS is designed to accommodate this information and, in addition, can report analytical methods and detection limits as well.

The GEDS is, however, not restricted to accepting Level 1 data only. It is flexible so that any reporting protocol can be included.

ORGANIC EXTRACT SUMMARY TABLE

Sample Sorbent Extract–II-3

	LC1	LC2	LC3	LC4	LC5	LC6	LC7	Σ
Total Organics, mg	18.2	22.3	253	29.7	11.0	46.3	15.1	390
TCO, mg	5.2	19.	73.	6.7	3.7	5.3	0.1	110
GRAV, mg	13.	3.3	180.	23.	7.3	41.	15.	280

Category	Assigned intensity--mg/___(m³, L, or kg)*							
Sulfur	100–0.6							0.6
Aliphatic HC's	10–0.06							0.06
Aromatics–Benzenes		10–0.06						0.06
Fused Arom 216		100–0.6	100–4	100–0.5				5.
Fused Arom 216		10–0.06	100–4	100–0.5				5.
Heterocyclic S		10–0.06	10–0.4	10–0.05				0.5
Heterocyclic N				10–0.05	–0.1†	100–0.7	10–0.02	1.
					–0.1†	10–0.07	100–0.2	0.3
Carboxylic Acids					–0.1†	100–0.7	10–0.02	1.0
Phenols					–0.01†	10–0.07	10–0.02	0.1
Esters					–0.01†	10–0.07		0.08

*Concentration for gas samples = mg/m³, for liquid samples = mg/L, for solid samples = mg/kg. Fill in actual m³, L, or kg value.

†Estimated assuming same relative intensities as LC6, since IR spectra of LC5 and LC6 are very simil r.

Figure 2-3. Organic extract summary table.

The sampling activity information group can also handle radionuclide data results and bioassay results. The bioassays may be either health effects or ecological effects tests.

SECTION 3

DATA ACQUISITION AND ORGANIZATION

3.0 INTRODUCTION

The purpose of this section is to demonstrate how the encoder would use the structural concepts discussed in Section 2 to prepare a set of source testing data for encoding into the GEDS. This will be demonstrated with a hypothetical example. This section will also discuss some special problems that may occur while encoding source test data. For example, how do you encode data from a Source Assessment Sampling System -- an instrument which collects samples from two media -- fine particles and gaseous? We cannot forsee all the peculiar situations and special problems that may occur during the encoding process, but the general guidelines and techniques given here should greatly facilitate this task. Feel free to call the EADS Data Base Program Manager or the EADS technical staff listed on page xi if any questions arise during the encoding process.

3.1 HOW TO BUILD A TEST SERIES

This section describes the techniques and the thought processes that the user should employ when encoding source testing data onto the GEDS data input forms. Using the techniques described here will be of particular benefit to the user who is not familiar with the EADS system and underlying concepts. To those who already have some experience with EADS, possibly through the use of the original Fine Particle Emissions Information System (FPEIS), these methods may already be familiar to some degree.

In most cases, the user will have either a test report or perhaps simply summary tables of results obtained from a source testing effort. The problem that now confronts the user is how to efficiently and accurately transfer that morass of data onto the GEDS data input forms. Experience has shown that the most efficient thing to do is to first organize the data and information before you -- on paper. The key to this organization of data is the pyramid structure of the GEDS. All of the EADS (i.e., GEDS, FPEIS, LEDS, and SDDS) are structured in a similar manner and the encoding forms and SERIES report are designed to reflect this structure. Indeed, source testing reports can be thought of as being arranged in such a manner. Looking at Figure 3-1, the pyramid structure becomes evident. Data is arranged so that general information, such as the source description and reference information, is situated at the apex of the pyramid. The next level down contains design information on the sources' effluent streams and control devices. The pyramid further expands into the tests performed on each effluent stream and the operating conditions of the source and control device(s) during those tests. The final level in the pyramid contains data on each of the samples taken

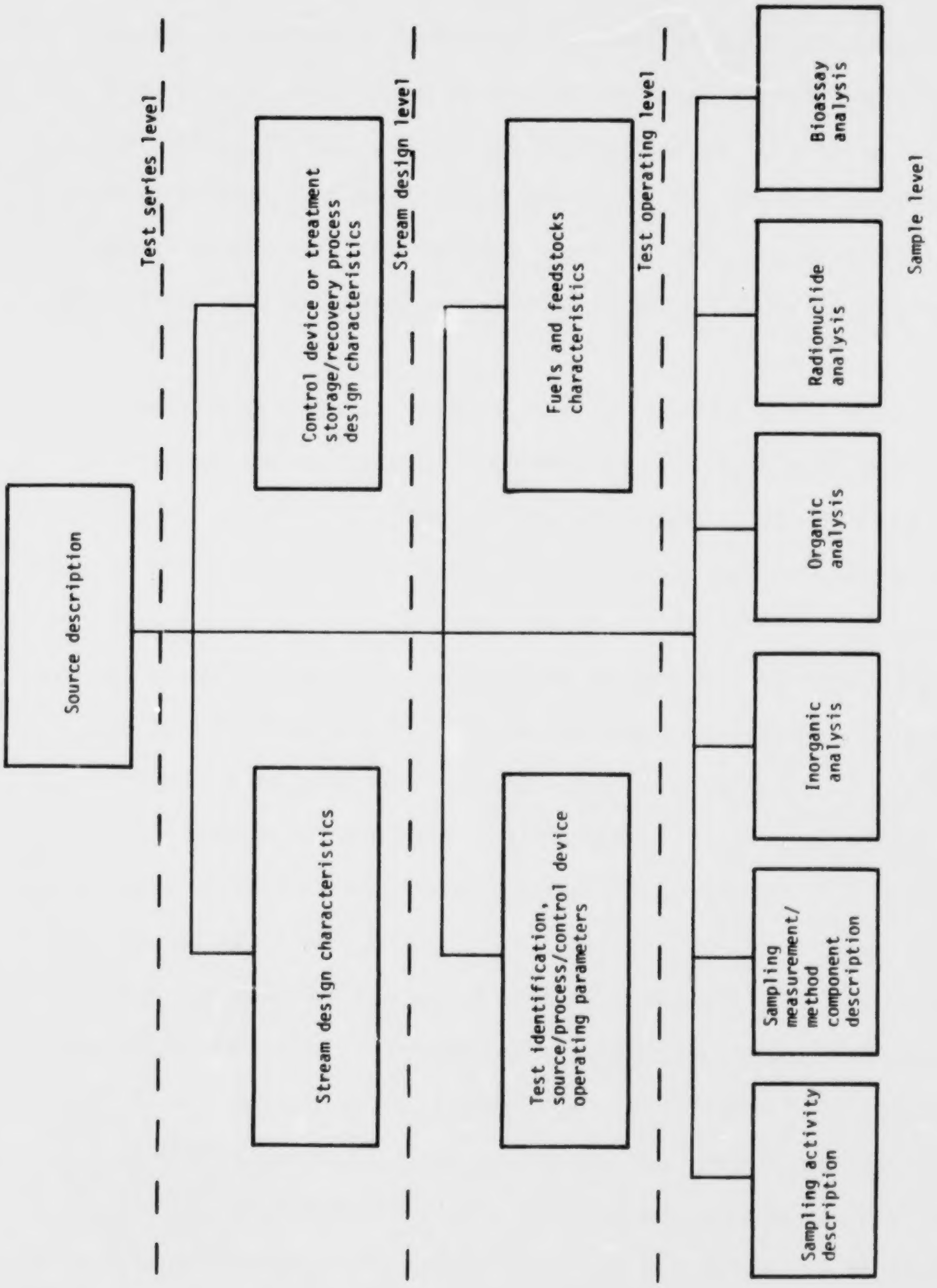

Source description
Test series level
Stream design characteristics
Control device or treatment storage/recovery process design characteristics
Stream design level
Test identification, source/process/control device operating parameters
Fuels and feedstocks characteristics
Test operating level
Sampling activity description
Sampling measurement/method component description
Inorganic analysis
Organic analysis
Radionuclide analysis
Bioassay analysis
Sample level

Figure 3-1. Waste stream data base structure and contents.

during each test. This is the most specific information contained in the data base. It includes chemical, physical, radionuclide, and bioassay analytical results. Think of the pyramid structure as descending from the general to the specific. The source description being general and analytical results being the most specific.

How then does the user arrange his source testing data into the pyramid structure? Very simply, the user should lay out a structure on paper similar to that shown in Figure 3-1. There will be one box at the test series level to represent the source. The stream design level will contain as many boxes as there are effluent streams. In a like manner, the test operating level will contain one box for each test performed on each stream. And finally, at the sample level, each test will contain as many boxes as there are samples. The user should then assign appropriate labels, according to his data, to the source, streams, tests and samples, and enter those labels in the corresponding boxes of the pyramid. This approach has two major benefits. One, it forces the user to understand and organize his data, and two, it structures the data in a manner that aids tremendously in encoding and proper ordering of the forms. You will recall that the data forms are organized in a manner similar to the data base itself. They proceed from the general to the specific.

Section 4 contains detailed encoding instructions which, when used in conjunction with the above organization methods, make the encoding task straightforward.

3.2 DATA INPUT FORM STRUCTURE

The GEDS data elements (see Table 2-1) are entered on eleven data input forms. The layout of the eleven forms is such that the data elements in any one test series that are least likely to change, are located on Form 1, and the most likely to change are on Forms 7 through 11. It becomes apparent that the input forms are arranged according to the hierarchical structure (i.e., a pyramid) of the data base as shown in Figure 3-1.

Forms 1 and 2 (see Section A.4 in the Appendix) include source description data, stream design characteristics and control device/ treatment process information. Because this is design data, it will not change for a given test series on a given source/control device/process combination. The information on Form 1 is contained in the test series level while the Form 2 stream/control device/process information is at the stream design level.

The test operating level is the third level down on the hierarchical structure and it, as the name implies, contains operating information -- operating in the sense that these are the conditions of the source, control device/process and fuels and feedstocks during the actual test. This information is entered on Forms 3 through 5.

The bottom level in the EADS structure is the sample level. This information is entered on Forms 6 through 11. These forms are expected to be the most frequently used in that often a number of measurement instruments, some with two or more components, are used in a given test. Also a variety of analyses are frequently performed on a collected sample.

Once all data input forms have been encoded, the forms must be put in a specific order. There are two important reasons for this. One, because the repetitive data feature (described in detail in Section 4) is predicated on correctly ordered input; and two, the computer processing performs order checks. The rules for ordering input are very straightforward and can be explained in two different ways.

Look at Figure 3-2, a typical test series. The input forms are ordered by starting at the top and moving down and left, checking off the boxes as you encounter them. When you can't go down and left any more, back up to the first place where you can go down and left again to an unchecked box. The input forms are ordered in the same way as the boxes are numbered in Figure 3-2. Remember that each box represents one or more input forms.

Each input form has multiple lines on it. Each line is identified by a letter and a number called a card number. Each major grouping of lines has the same letter and is identified on the input forms, e.g., F-fuels and feedstocks. Each line of input also has one or more of these fields (or data elements) -- test series number, stream ID, test ID, sample number, component number. Suppose that you are encoding a single test series. The test series number will be the same on all forms submitted. The first form will be Form 1, containing the source description and test series comments. All forms for the first stream follow. The stream characteristics and control devices on one or more Form 2's are next. Then comes all of the data about the first test on the stream on Forms 3, 4, and 5. The first sample of this test ID follows on Form 6. The first component of the sample follows on Forms 7, 8, 9, and 10. Then comes the second component, the third and so on. Then come bioassay data on the sample on one or more Form 11's. The second sample of the test comes next followed by its component and bioassay data. Then

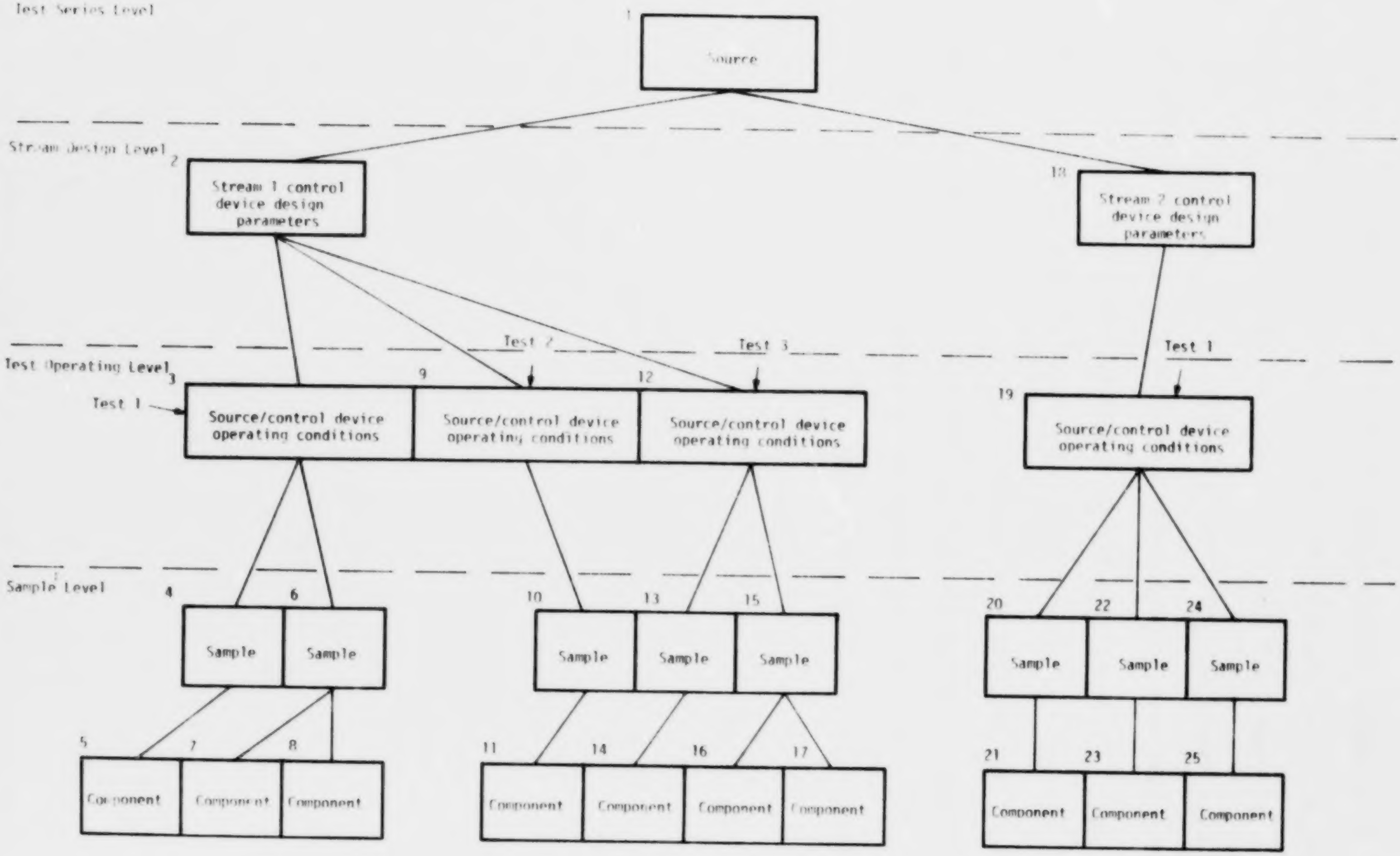

Test Series Level
1
Source
Stream Design Level
2
Stream 1 control device design parameters
18
Stream 2 control device design parameters
Test Operating Level
Test 2
Test 3
Test 1
3
9
12
19
Test 1
Source/control device operating conditions
Source/control device operating conditions
Source/control device operating conditions
Source/control device operating conditions
Sample Level
4
6
10
13
15
20
22
24
Sample
Sample
Sample
Sample
Sample
Sample
Sample
Sample
5
7
8
11
14
16
17
21
23
25
Component
Component
Component
Component
Component
Component
Component
Component
Component
Component

Figure 3-2. Forms ordering.

comes the third sample and its component and bioassay data, the fourth sample, and so on; to complete the data for the first test. Then there is another set of Forms 3, 4, and 5 describing the second test and sets of forms for each sample and component following. After all tests on the first stream have been encoded, then a new Form 2 is used to specify the second stream. The test, samples, and components of the second stream follow in the same way as they did for the first stream. Continue in this way until all streams have been encoded.

Although the stream ID, test ID, sample number and component number form a defacto page numbering scheme, it is recommended that the pages be consecutively numbered in the space provided.

3.3 STRUCTURE APPLICATION EXAMPLE

The techniques for organizing gaseous source sampling data are demonstrated in the following paragraphs using a hypothetical example. Table 3-1 shows a sampling log of source tests performed at a low Btu coal gasification plant. The log shows that two tests were performed at two sampling locations, the process heater stack gas and the liquor separator vent. The two tests correspond to two different source operating conditions where the plant was operating first at 80 percent of capacity and then at maximum rated capacity. A grab sample and a SASS train were used at each location under both operating conditions. In addition, a chemiluminescent analyzer was used to measure NO_x emissions at both locations, but only during full-load operation.

While the sampling log clearly shows what occurred during the testing program, it does not display this information in a manner such that the user can easily visualize how the data should be organized for encoding purposes. Nor does it provide any information on how the encoded forms are to be ordered before they are keypunched. At least for the beginning user, and we believe it's an excellent tool even for the experienced user, the data should be arranged in the pyramid structure shown in Figure 3-3. In our hypothetical example, the rearranged sampling log information would look like Figure 3-3. The gasification plant would be entered as the source at the test series level and the two sampled streams would at the next level down. The stream design level can contain any number of effluent streams. Following down to the test operating level, you can see that each of the two tests is labeled and entered into a box. Each stream thus has two tests, one at 80 percent load and one at full load. The sample level indicates which samples were taken during

TABLE 3-1. SOURCE SAMPLING LOG -- GASIFICATION PLANT

Stream	Test	Sample
1 -- Process heater stack gas	1 -- 80% load	1 -- Grab sample 2 -- SASS
	2 -- full load	1 -- Grab sample 2 -- SASS 3 -- NO_x chemiluminescence analyzer
2 -- Liquor separator vent	1 -- 80% load	1 -- Grab sample 2 -- SASS
	2 -- full load	1 -- Grab sample 2 -- SASS 3 -- NO_x chemiluminescence analyzer

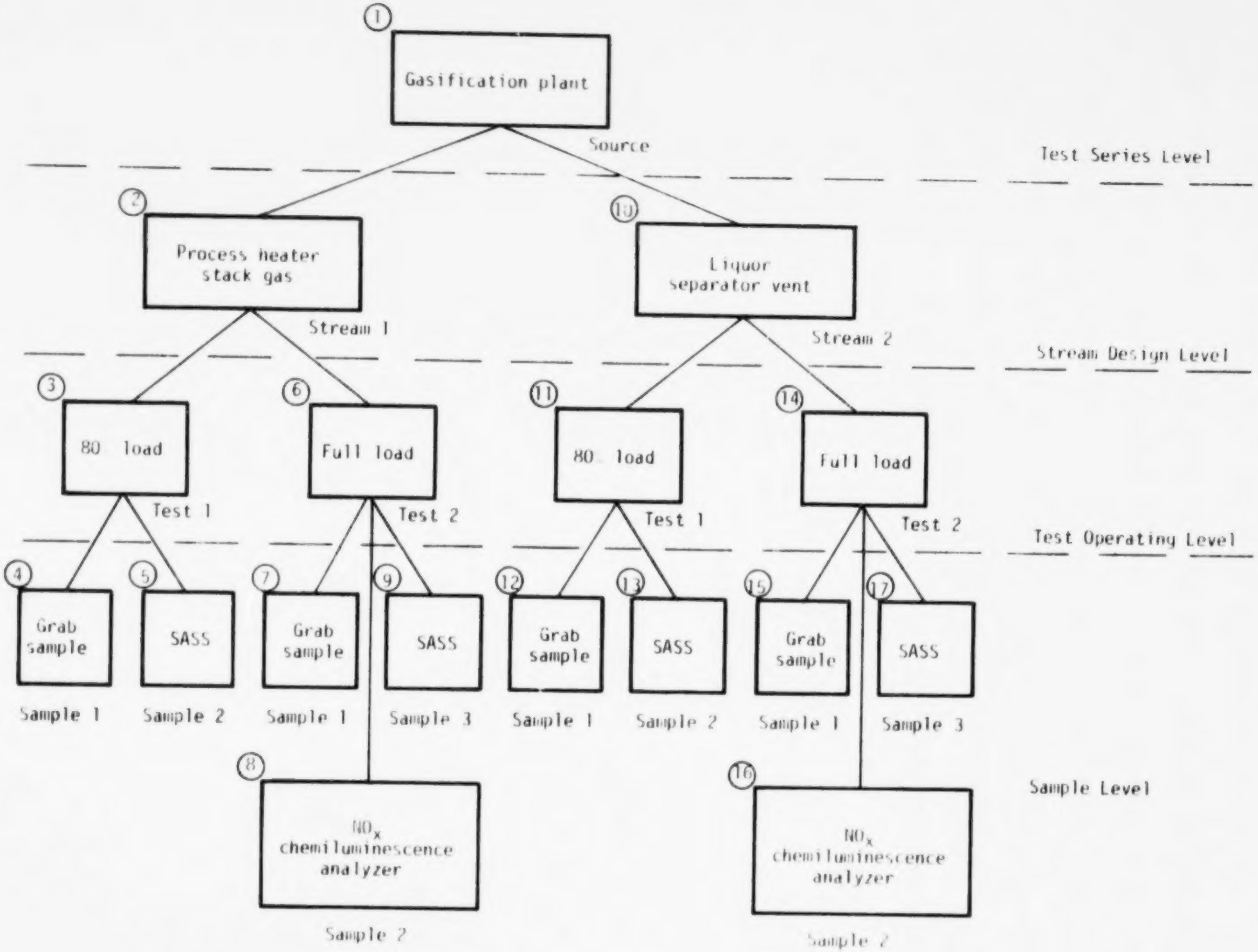

①
Gasification plant
Source
Test Series Level
②
Process heater stack gas
Stream 1
⑩
Liquor separator vent
Stream 2
Stream Design Level
③
80 load
Test 1
⑥
Full load
Test 2
⑪
80 load
Test 1
⑭
Full load
Test 2
Test Operating Level
④
Grab sample
Sample 1
⑤
SASS
Sample 2
⑦
Grab sample
Sample 1
⑨
SASS
Sample 3
⑧
NO_x chemiluminescence analyzer
Sample 2
⑫
Grab sample
Sample 1
⑬
SASS
Sample 2
⑮
Grab sample
Sample 1
⑰
SASS
Sample 3
⑯
NO_x chemiluminescence analyzer
Sample 2
Sample Level

Figure 3-3. Data structure -- gasification plant.

each test on each stream. Each box represents one measurement instrument or sample. The numbers in circles located at the upper left corner of each box on Figure 3-3 indicate the order in which the encoded data input forms should be arranged. The rule for ordering of forms is: starting at the top, move down and left, number the boxes consecutively as they are encountered. When you can't go down and left anymore, back up to the first place where you can go down and left again to an unchecked box. While the forms should be numbered in the manner indicated on Figure 3-3, recall that each number may represent one or more forms. For example the box:

③ 80 percent load

test 1

may include forms 3 through 5 which describe the operating conditions during test 1. The box:

④ grab sample

sample 1

may include forms 6, 7, 8, 9, 10 and 11.

3.4 SPECIAL ENCODING CONSIDERATIONS

The GEDS has a certain amount of flexibility built in and this enables it to accommodate data from a variety of sampling protocols and unusual source situations. The purpose of this section is to discuss some of these special situations and to familiarize the user with the manner in which EADS conforms to them. In addition, this section discusses the rationale for some of the encoding instructions described in Section 4.

3.4.1 Multimedia Test Series

Frequently in source sampling activities, multimedia effluent samples are collected and analyzed. This is particularly true in environmental assessment (EA) programs where the contractor is trying to assess the overall environmental impact of a stationary source. For example, if a coal-fired utility boiler equipped with NO_x controls, an electrostatic precipitator, and a flue gas desulfurization system was the subject of an EA testing program, streams from all media, gas, fine particle, liquid, and solid, would probably be sampled and analyzed. The analysis data from each specific media effluent stream would be encoded in its respective data base (i.e., gas stream analysis results would be encoded into the GEDS). You might ask yourself how, if data from one source is entered into four separate data bases in EADS, a user could benefit from this data. Each data base contains a cross reference to the other data bases containing data taken from the same source at the same point in time. This cross reference is in the form of the TSN. Thus, in our example, the GEDS file would contain the FPEIS, LEDS, and SDDS Test Series Numbers as cross references. Conversely, LEDS would contain the GEDS, FPEIS, and SDDS TSN's as cross references. FPEIS and SDDS would follow in the same manner.

3.4.2 Multiple Control Devices

The EADS recognizes the fact that an effluent stream may have multiple control devices. For example, a gaseous stream may have NO_x controls and a flue gas desulfurization unit in series. Up to five control devices can be accommodated per stream. During the encoding process, the user is required to assign a number to each control device. The control device number will be unique for that device in that test series. The device number is used to identify the set of design and operating parameters for that particular device in the event that there are multiple devices.

3.4.3 Parallel or Series Control Devices

Frequently an effluent stream will have two or more control devices for various pollutants either in a series or parallel arrangement. This situation is handled in the following way. In a series arrangement, the control devices are serially assigned unique device numbers 1, 2, 3, ... etc., to a maximum of five. Each control device will then have a Form 2 and a Form 3 encoded. These forms should be ordered in the same sequence as they occur in the effluent stream and in addition, group all Form 2's together and all Form 3's together. If the control devices are in parallel, the convention is to label them as 11, 12, 21, 22, etc. Each device will again have a Form 2 and a Form 3 and again they should be ordered in the same sequence that they occur in the effluent stream with all Form 2's together and all Form 3's together.

3.4.4 Fuels and Feedstocks

Frequently a stationary source of gaseous air pollution will have one or more fuels and/or material feedstocks as inputs to the process. These inputs are routinely sampled as part of most testing activities and are subsequently analyzed for a variety of parameters and purposes. For example, material balances around a process are usually performed on elements (e.g., sulfur) with the intent of validating the data and to assess the origin and fate of chemical species. The GEDS has two input forms devoted totally to recording information about the fuels/feedstocks and any chemical or physical analysis performed. In addition to the consumption rate and type of fuel/feedstock, the GEDS has data groups reserved for proximate and ultimate analyses (for fuels only), general characteristics (usually physical parameters such as viscosity or pourpoint), and chemical analyses. Information and analyses for up to nine different fuels and feedstocks from one source may be included in each test series.

The encoder of data should note that general characteristics may be entered as either number or text values. Normally such values would be entered as numbers (e.g., pourpoint, -10°C). However, occasionally either a range of values needs to be entered or possibly a word descriptor of some physical characteristic. Here, the entries would be written as text. More detailed instructions on this point can be found in Section 4, Group F.

In recognizing the variety of units in which fuels and feedstocks chemical analyses are reported, the GEDS has left the units selection for actual concentration open to the discretion of the user. This flexibility is not the case, however, when reporting actual concentrations of chemical species in effluent streams (on Forms 8 and 9). These units must be in $\mu g/m^3$.

3.4.5 Data Accuracy and Quality

The GEDS contains data elements that assist the user in assessing data quality, accuracy, and validity. These include identification of the testing group, analytical laboratories, analysis methods, sampling methods, high and low detection limits of the analytical methods, total sample quantities and aliquots, and QA/QC codes. The QA/QC codes are obtained by the user from the EADS Program Manager at the time the GEDS data input forms are encoded. Each analytical laboratory that has undergone a quality assurance/quality control audit will be assigned a unique QA/QC code. The code refers the user to a reference data base which contains the results of the audit. These QA/QC audits describe the efficiency and effectiveness of a particular laboratory in recovering a known concentration of a chemical species from a spiked sample, thereby giving the user of the laboratory's services an appraisal of the laboratory's performance. The QA/QC data base will contain each chemical species reported and will identify the analysis method used to detect the chemical. Also, the number of samples submitted, the average percent of recovery and its standard deviation, and the quality control frequency are reported for each chemical species or compound in the audit.

In the final analysis, the GEDS QA/QC data elements, however, only ensure the correctness of the data on an as reported basis. The responsibility for data validity lies with the people who collect and input the data.

3.4.6 Source Assessment Sampling System

The Source Assessment Sampling System (SASS) has three or more components that collect different samples simultaneously. The SASS train is the recommended EPA EA measurement instrument for gaseous streams which may contain fine particles. Complete detailed information on the SASS can be found in "IERL-RTP Procedures Manual: Level 1 Environmental Assessment (Second Edition)," EPA-600/7-78-201, October 1978. The SASS train (Figure 3-4) has a set of three cyclones (with nominal cut diameters of 10 µm, 3.5 µm, and 1 µm) followed by a filter which classifies fine particles in a gas stream according to size. Simultaneously, another component, the organics module, collects gaseous organic material while a third component, a set of impingers, collects volatile trace elements. Typically, each SASS component is separately subjected to a variety of analyses. EADS is designed to accommodate the data resulting from such an arrangement. Be sure, however, to encode this data in the correct data base. Even though the SASS is one sampling train, it produces data on fine particles and gaseous pollutants. Thus, the fine particle data would be in FPEIS, with the cyclones and filter being the components, and the organic and trace element data collected form the organic module and impinger components would be in GEDS.

3.4.7 Effluent Characteristics

This group of data is intended to accommodate any qualitative measurement of an effluent stream parameter, other than inorganic and organic chemical species, radionuclide, and bioassay results. This will typically include physical parameters of the sample such as opacity, odor, or color. Values may be entered on the forms as either number or text. For example, opacity would be encoded as a number, say 20 percent, whereas color would be encoded as a text value, light brown, for example. Space on the encoding forms is also provided for the analytical method and any applicable detection limits and their units.

[EE/S-003e]

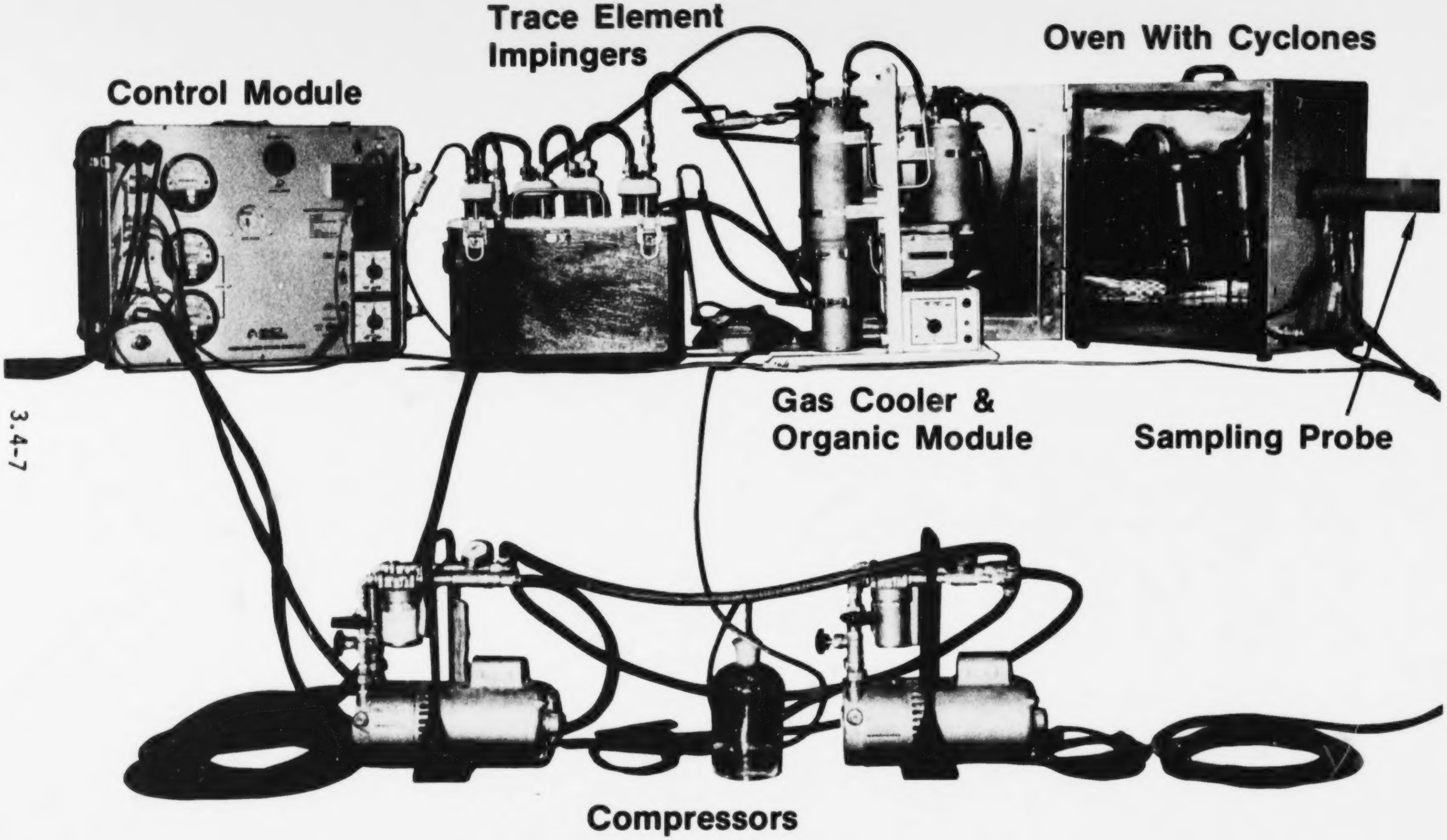

Trace Element
Impingers
Oven With Cyclones
Control Module
Gas Cooler &
Organic Module
Sampling Probe
Compressors

Figure 3-4. Source Assessment Sampling System.

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3.4.8 Reporting of Chemical Analysis Results

The EADS input forms have been developed so that a variety of sampling and analysis protocols can be accommodated. EPA/IERL-RTP's EA programs are expected to be one of the primary suppliers and users of data. Thus, in response to the special reporting protocols of EA programs, EADS has put emphasis in this area, without relegating other reporting protocols to a lesser position.

Specifically, Form 8 has been designed for all inorganic analysis results and organic analysis results that do not conform to Level 1 protocols. Form 9, however, is reserved exclusively for reporting organic analysis results that do conform to Level 1 protocol. Level 1 organic analyses require special reporting formats due to the mix of qualitative and semiquantitative results from analyses such as liquid chromatography fractionation and low resolution mass spectra. The purpose of this type of analysis is to identify the major classes of organic compounds in a process effluent stream and to estimate their concentrations. In Level 1 this is done by liquid chromatography which separates a sample into fractions characterized by a range of boiling points. These are called fraction ID's and are labeled LC1 through LC7 -- corresponding to groups of chemical species with successively higher boiling points. Both the whole sample and the LC fractions are analyzed for TCO and Grav concentrations. TCO analysis gives volatile organic material and Grav analysis yields nonvolatile organic material. This data in combination with qualitative results obtained from infrared analysis, called intensity values, and information about the source, enables the analyst to identify the chemical species in a waste stream sample. Occasionally, individual species are identified in an extension of Level 1 analysis, and their concentrations are determined. The GEDS is fully capable of accepting all this data. In addition, fractions, organic categories, and species are identified by a MEG number. This is a unique ID for that species and is part of a system used in EA methodology (Multimedia Environmental Goals for Environmental Assessment Volumes 1 and 2, EPA-600/7-77-136a, b, November 1977) for evaluating and ranking pollutants according to environmental impact. The encoder must use MEG numbers when inputting EA data (i.e., Level 1 or 2). Either MEG or CAS numbers ("Chemical Abstracts -- Chemical Substance Index," American Chemical Society) may be used for data obtained by some other sampling and analysis protocol. When this data is extracted from the data base as output, it will appear with the preferred chemical name first, then other less common names.

3.4.9 Reporting of Radionuclide Data

One complete form is devoted to recording radionuclide analysis results of gaseous samples. Actual source concentrations of radionuclides are to be recorded in the units, pCi/cubic meter. The isotopes most likely to be of interest include the following: U-238, Ra-226, Pb-210, PO-210, U-235, Th-232, Bi-212, Ac-228, and Bi-214. Also, note that space is available to include metastable isotopes (i.e., Kr-85M).

3.4.10 Bioassay Results

As part of EPA's EA scheme, biological indicators are coupled with chemical tests to assess the hazard potential of process waste streams. The Level 1 screening phase uses a series of short-term bioassays to detect acute biological effects. Bioassays may be either health-related or ecological tests. While EA methodology has specific recommendations for applying bioassays to samples,* it is frequently the case that these recommendations cannot be followed. For example, EA protocol says that particulates captured in a SASS train should be divided into two components -- those less than 3 microns and those greater than 3 microns. Frequently it is the case that neither component separately can meet the minimum sample quantity requirement for bioassay tests, so the components must be combined. Consequently Form 11, which records bioassay results, has no space for component sequence number. The encoder should record in the comments section which component sample was tested or if component samples were combined.

While most bioassay data elements on Form 11 pertain to all types of biotests, some apply to only specific tests. These are listed below:

Data Element	Bioassay Test
Type of Value	All except the Ames
Bacteria Mutagenicity Response	Ames only

"Level of Toxicity" is defined as "a qualitative expression of the bioassay results based upon a predefined range in LD_{50}, EC_{50} or LC_{50}, etc." Table 3-3* may be used as an aid in determining the Level of Toxicity for specific bioassays. Given a certain assay and response range, the encoder can determine whether the Level of Toxicity is high, moderate, low, or not detectable.

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*Duke, K. M., Davis, M. E., and Dennis, A. J., "IERL-RTP Procedures Manual: Level 1 Environmental Assessment Biological Tests for Pilot Studies," EPA-600/7-77-043, April 1977.

TABLE 3-2. RESPONSE RANGES FOR RANKING OF VARIOUS BIOTESTS

ASSAY	ACTIVITY MEASURED	MAD	RESPONSE RANGES HIGH	MODERATE	LOW	NOT DETECTABLE
Health Tests						
Ames	Mutagenesis	5 mg/plate or 500 μL/plate	<0.05 mg or <5 μL	0.05-0.5 mg or 5-50 μL	0.5-5 mg or 50-500 μL	ND at >5 mg or ND at >500
RAM, CHO, WI-38	Lethality (LC_{50})	1,000 μg/mL or 600 μL/mL	<10 μg or <6 μL	10-100 μg or 6-60 μL	100-1,000 μg or 60-600 μL	LC_{50} > 1,000 μg or LC_{50} >600 μL
Rodent	Lethality (LD_{50})	10 g/kg or 10 mL/kg	<0.1	0.1-1.0	1-10	LD_{50} >10
Ecological Tests						
Algae	Growth Inhibition (EC_{50})	1,000 mg/L or 100%	<20% or <200 mg	20-75% or 200-750 mg	75-100% or 750-1,000 mg	EC_{50} >100% or EC_{50} >1,000 mg
Fish	Lethality (LC_{50})	1,000 mg/L or 100%	<20% or <200 mg	20-75% or 200-750 mg	75-100% or 750-1,000 mg	LC_{50} >100% or LC_{50} >1,000 mg
Invertebrate	Lethality (LC_{50})	1,000 mg/L or 100%	<20% or <200 mg	20-75% or 200–750 mg	75-100% or 750-1,000 mg	LC_{50} >100% or LC_{50} >1,000 mg

MAD = Maximum Applicable Dose (Technical Limitations)
LD_{50} = Calculated Dosage Expected to Kill 50% of Population
LC_{50} = Calculated Concentration Expected to Kill 50% of Population
EC_{50} = Calculated Concentration Expected to Produce Effect in 50% of Population
ND = Not Detectable

SECTION 4

ENCODING INSTRUCTIONS FOR GEDS DATA INPUT FORMS

This section presents detailed, card-by-card, encoding instructions for each GEDS data element on the Standard Data Input Forms. The instructions are separated into 12 groups (identified by the letters A, B, C, D, E, F, H, K, L, M, R, and T) corresponding to the major groupings of GEDS data elements. The GEDS Data Input Form number (1 through 11) is given for each group. While reading these instructions, it would be beneficial to refer to the blank input forms in Appendix A.4.

4.0 GENERAL RULES

General instructions that apply to data coding include the following:

- The letter "O" is to be encoded "Ø" and zero is encoded "0".
- Zeros are treated as numbers. Blank spaces in a field indicate either a lack of data, or that the pertinent data have been coded for the preceding test conditions or sampling activity. (See the discussion on the repetitive data feature in Section 4.1.) To blank out a data field, or to prevent data from being automatically repeated by the EDIT program, encode 9999... in all columns in the field for numeric fields, and NA in the first two columns of the field for alphanumeric fields.

- All numeric data shall be right-justified and all alphanumeric data shall be left-justified, except where noted otherwise.
- Only specified alphabetical or numerical characters and a few symbols (%, &, #, /, +, -, <, >, and all punctuation marks except the colon) are allowed to be entered in the columns where allowed. No unusual marks are to be made in the spaces. No data field headings are to be changed and only data appropriate to the field are to be entered. This rule prevents unnecessary keypunching errors in processing the forms. No colons are permitted anywhere.
- Do not use Greek letters as these cannot be interpreted by the computer. For example, microgram (μg) is encoded UG. Refer to Table A-14 in the Terminology Reference Manual or the tables at the end of this section for the encoding of engineering units. SI units are used thoughout the EADS, except where otherwise noted.
- Only the allowed coding values may be entered in columns that require coding symbols. When ± is indicated at the top of the column, enter either + or -, as appropriate. Also, indicate if the data being encoded are less than, greater than, or equal to a value by using the signs <, >, or leaving the space blank, as noted on the appropriate field heading.
- The small triangle between columns on the forms represents the decimal point. Enter the fractional decimal digits to the right of the triangle.
- Leave all the shaded portions on the forms blank.

- The following identification data elements must be entered on the first card of every section (data group) where they appear.

Data Element	Card Columns	Instructions
Test series number	2-6	Enter on all forms.
Stream number	7-8	Enter only on Forms 2 through 11.
Test ID number	9-11	Enter only on Forms 3 through 11.
Sample number	12-13	Enter only on Forms 6 through 11.

Note, that if encoding instructions are not given for card columns 1 through 15 for any card, the instructions are the same as those for the previous card.

- In several instances, more cards than allotted on the forms may be added by the user if needed to encode all the data. The detailed encoding instructions indicate the corresponding data elements, and specify a limit to the number of additional cards that may be included.
- Many data elements, identified in the detailed encoding instructions, require standard nomenclature. The user must use data from the tables given in the Terminology Reference Manual to encode these data elements (Tables A-1 through A-15). All standard nomenclature is left-justified.
- Whenever the data exceed the available space on the forms, use the available space completely, then finish the discussion by using the comments section of the appropriate level (i.e., test series, test, sample, or component, described in Section 2).
- Whenever there are pertinent data for which no data elements exist, use the comments section of the appropriate level.

- Make the text as brief as possible through the use of abbreviations, precise words, and elimination of redundant words. The text should always start at the leftmost column (i.e., left-justified).
- The encoding instructions are designed to apply to the majority of cases for which data will be reported. But, it is recognized that unusual situations (source/control system combinations, for example) may occur. If you have data that do not correspond with the encoding instructions, make reasonable assumptions to reflect the actual test data, or contact the EADS Technical Staff for guidance.
- When more than one control device is used, use a separate data input Form 2 for each control device used. Be sure to give each control device a unique number within the test series. Up to five control devices in a test series may be coded for a given source emission stream.
- When more than one source is discharging into an effluent stream, encode the data for one source (usually the dominant one), and refer to the other source(s) in the test series comments.
- If data are reported for different components of a sampling instrument separately and combined, define component numbers for all cases (on Form 7). For example, for the gas components of a SASS train:

  Component number 1 = XAD-2 Resin
  Component number 2 = Impinger
  Component number 3 = Resin and Impinger, combined.

- If the data from the sampling method are not split into components, encode the component sequence number = 01, and the component name as TOTAL SAMPLE (on Form 7).
- After all the forms are encoded and put in order (see Section 3 for a discussion of the ordering of the completed forms), paginate the forms in the indicated spaces to keep them organized and to prevent loss.
- It is critical to include all "zero" cards which start a data group. Specifically, these cards are A0, C0, D0, E0, F0, H0, and K0. These cards initialize indices which are used to load the data into the data base. These indices are the Test Series Number, the Stream Number, the Device Number, the Test ID Number, the Feed Material Sequence Number, the Sample Number, and the Component Sequence Number, respectively for the above cards, and starred below where they first occur.

  The information that is REQUIRED on these cards is as follows:

Card A0 -- *Test Series Number
Source Category
Source Type
Product/Device Type

Card C0 -- Test Series Number
*Stream Number
Stream Name

Card D0 -- Test Series Number
Stream Number
*Device Number
Generic Device/Process Type
(If uncontrolled, enter "NONE". If not known, enter "NOT SPECIFIED".)

Card E0 -- Test Series Number
Stream Number
*Test ID Number

Card F0 -- Test Series Number
Stream Number
Test ID Number
*Feed Material Sequence Number
Source Feed Material
(If data are not available, enter "NOT SPECIFIED".)

Card H0 -- Test Series Number
Stream Number
Test ID Number
*Sample Number
Method Type and Measurement Instrument/Method
(If not known, enter "NOT SPECIFIED".)

Card K0 -- Test Series Number
Stream Number
Test ID Number
Sample Number
*Component Sequence Number
Component Name (If not specified, enter "TOTAL SAMPLE".)

These cards and data elements must be included even if no other data are encoded. A "zero" card must be included whenever any of the indices are reinitialized; that is whenever the encoder returns to the start of a data group. For example, when a second sample is taken, the encoder must include another CARD H0 with a new Sample Number.

- In addition to the above, the following data elements are also required to be entered on the forms:

CARD A1 -- Process Type
Feed Material Category

CARD H2 -- Sampling Location Code
Sampling Location Description

- Instruct keypunchers not to punch a card unless there are handwritten data entered on the card.

4.1 LABOR SAVING FEATURES

In developing the data input forms and the data processing programs, several labor saving features have been introduced. These features reduce time, labor, and cost on the part of the encoder. However, misunderstanding of these features may result in the entering of erroneous data. The labor saving features are explained below. If the explanation is not clear, the safe rule to remember is "if in doubt, fill it out."

4.1.1 Repetitive Data Feature

The "Repetitive Data Feature" is an important labor saving device because it frees the encoder from having to enter repetitive data. In general, this means that asterisked (*) fields on the input forms need only be filled out when there is a change in the value of that field. Putting in additional values or deleting existing values can also be accommodated by the repetitive data feature.

However, there are limits and conditions. These are shown in Figure 4-1, the schematic representation of a single test series with specific groupings. The hierarchical (level) structures of the EADS data base are also shown. The boxes outlined with dashed lines (----) show the limits on the use of the repetitive data feature. For example, at the sample level, notice that repeating component data can be accommodated in a single test across component groups, but not across different tests. Operating conditions data at the test level can be accommodated across tests but not across streams. In general, the limits can be described by the following rule. The repetitive data feature operates at the stream, test, and sample levels of the EADS data base. It only operates across component groups which have the same data group at the next higher level

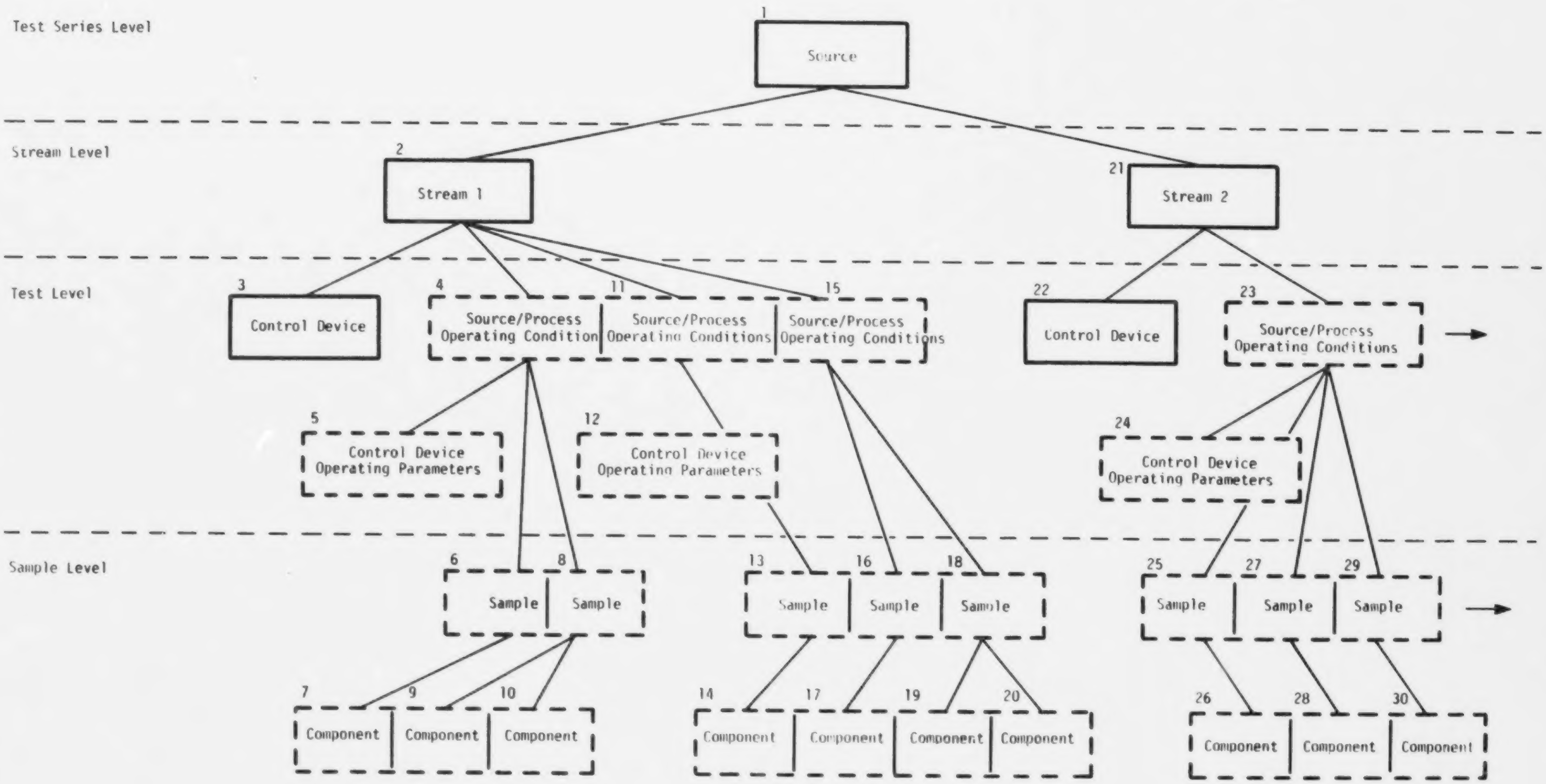
Test Series Level
1
Source
Stream Level
2
Stream 1
21
Stream 2
Test Level
3
Control Device
4
Source/Process Operating Condition
11
Source/Process Operating Conditions
15
Source/Process Operating Conditions
22
Control Device
23
Source/Process Operating Conditions
5
Control Device Operating Parameters
12
Control Device Operating Parameters
24
Control Device Operating Parameters
Sample Level
6
Sample
8
Sample
13
Sample
16
Sample
18
Sample
25
Sample
27
Sample
29
Sample
7
Component
9
Component
10
Component
14
Component
17
Component
19
Component
20
Component
26
Component
28
Component
30
Component

Figure 4-1. Repetitive data feature structure.

of the data base. For example, it operates across components at the sample level until the operating conditions (test level) change.

All the data elements for which the repetitive data feature is valid are identified by an asterisk (*) on the input forms.

In many instances, a particular data element may not be constant for all its occurrences. It may have one value for its first few occurrences, then change values or not be known for other occurrences. In these situations, the value of the data element must be reinitialized to the new value each time the value changes. If the data are not known, the correct way to reinitialize the value is to enter "NA" in the first two columns of the field for alphanumeric data or "9" in every card column for numeric data. Consider the following example.

Suppose that there are 20 samples with the same source/process operating conditions. In the first nine samples, SAMPLE TEMPERATURE is 110°C. In the next four it is 120°C; it is unknown for the next three, and is 150°C for the remainder. In the first sample, enter 110 in columns 58 through 61 of the HO card. The value has now been initialized. The same field can be left blank for the next eight samples because they have the same value. For the tenth sample, the value 120 is entered, reinitializing temperature. The temperature on the next three samples can be left blank because they are also 120. In sample 14, where the temperature is unknown, the value 9999 is entered as "null" value, reinitializing the field. If this were not a numeric field, then "NA" should be entered as the "null" value. In sample 17, the value 150 would be entered and then the field would be left blank for samples 18, 19, and 20.

In this way, with the repetitive data feature, only four unique values must be encoded instead of 20. When there are a number of unchanging values, this feature will save considerable time and effort.

4.1.2 Control Device and Design Parameters

Another example is in the case where two different streams from the same source each have an identical control device installed. Here, one should assign the same Device Number (CARD D0) to each. The repetitive data feature will permit the encoder to fill out the data on all D cards (D0, D1, D2, D3, and D4) just once, leaving those for the second control device blank. All of the data for the second device will automatically repeat. For example, on CARD D4, once the design parameter data have been initialized, they remain constant until changed. Be sure to include a CARD D0 with the Device Number on it, to reference the control device.

The only exception to the encoding instructions for an unknown or "null" value occurs when such a value is needed in the first occurrence. In that instance, leave the field blank for an unknown or "null" value.

4.1.3 Operating Parameter Serial Number Feature

The Parameter Number (CARD E2, cc 16 and 17) in the control device operating parameter group is also a labor saving feature. The Control Device/Treatment Process Operating Parameters as encoded for the first Test ID Number will be printed in their entirety for succeeding Test ID Numbers within the same Stream Number unless changed. Operating parameter names and values which do not change between tests will be duplicated automatically for subsequent tests provided that only the parameter number is reentered for the new test.

If operating parameters happen to change between tests, only the parameter number and its new value need to be encoded. The data which do not change do not have to be reencoded. The EDIT program will automatically reproduce the parameter name.

Be sure to include a CARD E1 to identify the control device/treatment process to which the parameters apply.

To null out a previously entered Parameter Name and Value, enter the parameter number and enter NA for the parameter name. Here again, include a CARD E1.

4.2 ENCODING INSTRUCTIONS

GROUP A -- SOURCE DESCRIPTION -- FORM 1

Card Column	Data Element	Encoding Instructions
CARD A0		
1	Data Base Code	Do not change. Denotes data base. G-GEDS.
2-6	Test Series Number	Enter as a right-justified integer number the permanent test series number, assigned by the EADS Program Manager. If such an assignment has not been made, enter a nonzero sequential number for each test series reported. This number will be used for preliminary identification purposes only.
7-8	Stream Number	Leave blank.
9-11	Test ID Number	Leave blank.
12-13	Sample Number	Leave blank.
14-15	Card Number	Do not change.
16-35	Source Category	Enter the source category as text from Table A-1.* This is the grouping of major generic industries or source classes; i.e., the broadest description of a source. Examples include COMBUST-ENERGY, CHEMICAL MANUFAC, METALS, and NATURAL PRODUCTS. Note that the list of standard nomenclature is not complete, but will be added to as needed.
36-55	Source Type	Enter the source type as text from Table A-1. This identifies the kind of source within the source category. Examples include INDUSTRIAL, INORGANIC ACIDS, PRIMARY FERROUS, and WOOD.
56-75	Product/Device Type	Enter the product or device type as text from Table A-1. This identifies the general processes or the specific product. Examples include BOILER, SULFURIC ACID, STEEL, and PULP AND PAPER.

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*In the Terminology Reference Manual

GROUP A -- SOURCE DESCRIPTION -- FORM 1

Card Column	Data Element	Encoding Instructions
CARD A0 (cont.)		
76-79	SIC Code	Enter as a four-digit integer number the U.S. Department of Commerce SIC Code for the source. Use zeroes for unknown trailing digits; e.g., textile mill products whose SIC number is 22 would be entered as 2200. (See the Standard Industrial Classification Manual, Executive Office of the President -- Office of Management and Budget, prepared by the Statistical Policy Division, 1972, GPO Stock No. 4101-0066.)
80	Blank	Leave blank.
CARD A1		
16-35	Process Type	Enter the process type as text from Table A-1. This identifies the unique process being tested. Examples include TANGENTIAL, CONTACT PROCESS, BLAST FURNACE, and SULFATE PULPING.
36-41	Design Process Rate	Enter the design capacity of the process as a right-justified integer number.
42-47	Design Process Rate Units	Enter the units of the design process rate as text from Table A-14. The units should reflect the type of process tested.
48-57	Feed Material Category	Enter as text from Table A-2 the general category of the process feed material or fuel. A detailed description of this is given at the test data level. Examples include COAL, OIL, GAS, WOOD, SOLIDWASTE, and MTL SCRAP.
58-80	Source Name*	Enter the name of the source as text.

---

*Enter CONFIDENTIAL for confidential or proprietary data.

GROUP A -- SOURCE DESCRIPTION -- FORM 1

Card Column	Data Element	Encoding Instructions
CARD A2		
16-40	Site Name*	Enter as text the name of the site where the source is located.
41-60	Street/Box Number**	Enter the number and name of the source/site street address as text.
61-78	City**	Enter the name of the city, township or area.
79-80	State**	Enter the two-letter code for the state or Canadian Province in which the source is located. Use the standard nomenclature in Table A-3.
CARD A3		
16-20	Zip Code**	Enter the zip code in which the source is located.
21-25	Country	Enter as text an abbreviation for the country in which the source is located. Use standard nomenclature provided in Table A-3.
26-30	FPEIS TSN	Enter the Fine Particle Emissions Information System Test Series Number associated with fine particulate information which was collected from the same source during the same sampling program, right-justified. If none, leave blank.
31-35	SDDS TSN	Enter the Solid Discharge Data System Test Series Number associated with solid discharge sample and analysis results obtained from the same source during the same sampling program, right-justified. If none, leave blank.
36-40	Blank	Leave blank.
41-45	LEDS TSN	Enter the Liquid Effluent Data System Test Series Number associated with liquid effluent sample and analysis results obtained from the same source during the same sampling program, right-justified. If none, leave blank.

---

*Enter CONFIDENTIAL for confidential or proprietary data.

**Leave blank for confidential or proprietary data.

GROUP A -- SOURCE DESCRIPTION -- FORM 1

Card Column	Data Element	Encoding Instructions
CARD A3 (cont.)		
46-54	Blank	Leave blank.
55-60	Start Date	Enter the start date as MM-DD-YY. This is the starting date of the field sampling.
61-66	Finish Date	Enter the finish date as MM-DD-YY. This is the finishing date of the field sampling.
67-80	Blank	Leave blank.
CARD A4		
16-45	Sponsor Organization	Enter the name of the organization who sponsors the sampling program as text (e.g., EPA).
46-55	Contract Number	Enter the number of the sponsoring organization contract as text.
56-58	TO/TD Number	Enter the EPA task order or technical directive number as a right-justified integer.
59-80	Name of Sampling Group/Contractor	Enter the name of the sampling group or contractor as text. If there is more than one sampling group, enter additional groups in test series comments.
CARDS A5 AND A6		
16-80	Reference Report Title*	Enter as text the title of the report from which the data are reported. Use both cards as needed.
CARD A7		
16-45	Reference Report Author**	Enter the name of the primary author of the report as last name, first name, and initial (e.g., Doe, John A.).

---

*Enter CONFIDENTIAL for confidential or proprietary data.
**Leave blank for confidential or proprietary data.

GROUP A -- SOURCE DESCRIPTION -- FORM 1

Card Column	Data Element	Encoding Instructions
CARD A7 (cont.)		
46-65	Reference Report Number**	Enter as text the number, as assigned by the sponsoring organization, of the article or report in which the data are reported.
66-80	Reference Report Publication Date**	Enter the publication date of the report in text form as month and year (e.g., July 1979).
CARD A8		
16-35	Reference Report NTIS Number	Enter the NTIS number of the report as text.
36-80	Blank	Leave blank.

**Leave blank for confidential or proprietary data.

GROUP B -- TEST SERIES COMMENTS -- FORM 1

Card Column	Data Element	Encoding Instructions
CARD BO		
16-17	Line Number	Enter a sequential integer number for each line of test series comments.
18-80	Test Series Comments	Enter test series comments as text. Unlimited cards may be added as needed.

GROUP C -- STREAM DESIGN CHARACTERISTICS -- FORM 2

Card Column	Data Element	Encoding Instructions
CARD CO		
7-8	Stream Number	Enter a sequential, right-justified integer number for each gas stream sampled at the source.
16-21	Flowrate	Enter as a decimal number the design total volumetric flowrate of the gas in the sampled stream at normal maximum operating conditions. The decimal point is indicated.
22-27	Flowrate Units	Enter the flowrate units as text from Table A-14 (e.g., m^3/s).
28-31	Velocity	Enter as a decimal number the design velocity of the gas stream in m/sec at normal maximum operating conditions. The decimal point is indicated.
32-35	Temperature	Enter as a right-justified integer number the design temperature of the gas in the sampled stream at normal maximum operating conditions in units of degrees Celsius.
36-38	Pressure	Enter as a decimal number the design absolute pressure, in units of kPa, of the gas stream at normal maximum operating conditions. The decimal point is indicated.
39-41	Moisture Content	Enter as a decimal number the design moisture content, in percent by volume, of the gas stream at normal maximum operating conditions. The decimal point is indicated.
42-46	Stack height	Enter as a decimal number the height of the stack in meters, relative to ground level. The decimal point is indicated.
47-80	Stream Name	Assign a name for each gas stream sampled at the source (i.e., process heater flue gas, boiler flue gas, air preheater gas, etc.) and enter as text.
CARDS C1 AND C2		
16-80	Stream Comments	Enter stream comments as text. Use both cards as needed.

GROUP D -- CONTROL DEVICE/TREATMENT PROCESS -- FORM 2

Card Column	Data Element	Encoding Instructions
CARD D0		
16-17	Device Number	Enter a serially assigned, right-justified integer number for each control device and/or treatment process. This number will remain unique through the entire test series for a specific control device/treatment process. Up to five devices may be included per stream. Note: Space for one control device/treatment process is provided on Form 2. If more than one device is encoded, do not repeat CARDS C0, C1, and C2 on subsequent Form 2's for the same stream.
18-37	Generic Device/ Process Type	Enter the type of generic process as text. Use standard nomenclature provided in Table A-4(a). If no control or treatment is applied, enter "NONE". If not known enter "NOT SPECIFIED".
38-70	Design Type	Enter the control device/treatment process design type as text. Use standard nomenclature provided in Table A-4(a). If none, leave blank.
71-80	Blank	Leave blank.
CARD D1		
16-35	Specific Process/ Device Type	Enter the control device/treatment process specific type as text. Use standard nomenclature provided in Table A-4(a). If none, leave blank.
36-47	Device/Process Class	Enter the device/process class as text. Use only standard nomenclature given in Table A-5.
48-77	Device/Process Commercial Name	Enter the device/process commercial name and model number (if known) as text.
78-80	Blank	Leave blank.

GROUP D -- CONTROL DEVICE/TREATMENT PROCESS -- FORM 2

Card Column	Data Element	Encoding Instructions
CARD D2		
16-45	Manufacturer	Enter the name of the device/process manufacturer as text.
46-80	Blank	Leave blank.
CARD D3		
16-17, 48-49	Sequence Number	Enter a sequential, right-justified integer number for each device/process keyword to be encoded. Enter first two keywords on the first card (or line), etc. Add four more cards as necessary.
18-47, 50-79	Device/Process Keyword	Enter as text the word or words that best describe the device/process in greater detail. The selection of these keywords is at the discretion of the encoder. Enter two keywords per card.
80	Blank	Leave blank.
CARD D4		
16-17	Design Parameter Number	Enter a nonzero, sequential number (starting from 1, right-justified) for the control device design specification. Add five more cards as necessary.
18-47	Design Parameter Name	Enter as text the design specification as standard nomenclature, from Table A-6(a).
48	Value Type	Enter T if the parameter is a text parameter, or N if it has a number value.
If cc 48 contains an N:		
49-56	Number Value	Enter the numeric value in the form nn▲nn E ± nn.
57-80	Units	Enter the units of the number value as text, from Table A-6(a).

Card Column	Data Element	Encoding Instructions
CARD D4 (cont.)		
If cc 48 contains a T:		
49-56	Blank	Leave blank.
57-80	Text Value	Enter the text value and any associated units.

GROUP E -- TEST IDENTIFICATION -- FORM 3

Card Column	Data Element	Encoding Instructions
CARD E0		
9-11	Test ID Number	Enter a sequential, right-justified integer number for each test. A test is defined as a sample or series of samples at a particular source/control operating condition at a given point in time. This number may be serially assigned by the user at the time the data is encoded.
16-21	Test Date	Enter the date the test was conducted or begun as an integer number in the form MM-DD-YY.
22-25	Start Time	Enter the test starting time as a right-justified integer number, on the basis of a 24-hour day (military time).
26-29	End Time	Enter the test finish time as a right-justified integer number, on the basis of a 24-hour day (military time).
30-60	Operating Mode	Enter the mode of operation of the source at the time of the test as text. Examples of modes are batch, continuous, intermittent, cyclic, etc.
61-64	Percent of Design Capacity	Enter the percent of the design capacity at which the source is operating during the time of the test as a decimal number. The decimal point is indicated.
65-80	Blank	Leave blank.
CARD E1		
16-17	Device/Process Number	Enter the unique identifying number for each control device or treatment process as defined previously on CARD D0 in this test series. Note: Space for two control device/treatment processes is provided on Form 3. If more than two devices are encoded, do not repeat CARD E0 on subsequent Form 3's for the same Test ID.
18-80	Blank	Leave blank.

GROUP E -- TEST IDENTIFICATION -- FORM 3

Card Column	Data Element	Encoding Instructions
CARD E2		
16-17	Operating Parameter Number	Enter a sequential, right-justified integer number for each of the control device/treatment process operating parameters. Twenty-one more cards may be added as needed, per device.
18-47	Operating Parameter Name	Enter the control device/treatment process operating parameter as text using standard nomenclature from Table A-6(a).
48	Value Type	Enter N if the parameter has a number value, and T if it is a text parameter.
If cc 48 contains an N:		
49	$\lessgtr$	If the value of the parameter is indicated to be less than or greater than a value, enter the appropriate sign here. Otherwise, leave blank.
50-56	Number Value	Enter the numeric value in the form $n_{\blacktriangle}nn\ E \pm nn$.
57-80	Units	Enter the units of the number value as text, from Table A-6(a).
If cc 48 contains a T:		
49-56	Blank	Leave blank.
57-80	Text Value	Enter the text value and any associated units.
CARDS E7, E8, and E9		
16-80	Comments	Enter comments pertaining to the test operating conditions, as text.

Note: See Section 4.2 for a discussion of the labor saving feature for operating parameters.

GROUP F -- FUELS AND FEEDSTOCKS -- FORM 4

Card Column	Data Element	Encoding Instructions
CARD FO		
16-45	Source Feed Material	Enter as text the specific name of the source feed material (e.g., Western PA Bituminous). If data are not available, enter "NOT SPECIFIED".
46-62	Feed Material Rate and Units	Enter the measured operating (not design) input rate of the source as text with the appropriate units.
63-67	Feed Material Sample Mass	Enter the mass of the feed material sample as a decimal number. The decimal point is indicated.
68-73	Feed Material Mass Units	Enter the appropriate units of the sample as text, from Table A-14.
74-79	Blank	Leave blank.
80	Feed Material Sequence Number	Enter a sequential integer number to identify each feed material or fuel type used.
CARD F1		
16-55	Laboratory Name	Enter the name of the laboratory that performed the fuels and/or feedstocks analysis as text. If more than one laboratory was used and the names do not fit here, include one name here and the other(s) in the comments on Form 5.
56-58	QA/QC Code	Enter the laboratory quality assurance/ quality control code, if known.
59-63	Feed Material Sample Volume	Enter the feed material sample volume as a decimal number. The decimal point is indicated.
64-70	Volume Units	Enter the appropriate volume units as text from Table A-14.
71-79	Blank	Leave blank.
80	Feed Material Sequence Number	Same as CARD FO.

GROUP F -- FUELS AND FEEDSTOCKS -- FORM 4

Card Column	Data Element	Encoding Instructions
CARD F2		
16-31, 43-61	Proximate Analysis Parameter	The parameter associated with a proximate fuel analysis as per ASTM D3172-73. This is preprinted on the form.
32-38, 62-68	Parameter Value	Enter the value of the proximate analysis parameter as a decimal number. The decimal point is indicated.
39-42, 69-73	Units	These are preprinted on the form.
74-79	Blank	Leave blank.
80	Feed Material Sequence Number	Same as CARD FO.
CARD F3		
16-25, 31-40 46-55, 61-70	Ultimate Analysis Parameter	The parameter associated with an ultimate fuel analysis as per ASTM D3176-74. This is preprinted on the form.
26-30, 41-45 56-60, 71-75	Value	Enter the value of the ultimate analysis parameter, as a decimal number, in units of percent by weight. The decimal point is indicated.
76-79	Blank	Leave blank.
80	Feed Material Sequence Number	Same as CARD FO.
CARD F4		
16-27	Parameter Name	Enter the name of the fuels and feedstocks parameter analyzed as text. Do not include inorganic trace elements or organic chemical species and compounds. Examples are bulk density, viscosity, pour point, etc.
28	Value Type	Enter N if the parameter has a number value and T if it is a text parameter.

GROUP F -- FUELS AND FEEDSTOCKS -- FORM 4

Card Column	Data Element	Encoding Instructions
CARD F4 (cont.)		
If cc 28 contains N:		
29	$\lessgtr$	If the value of the parameter is indicated to be less than or greater than a value, enter the appropriate sign here. Otherwise, leave blank.
30-36	Number Value	Enter the value of the fuels and feedstocks parameter analyzed, in the form n▲nn E ± nn.
37-54	Units	Enter the units of the parameter analyzed as text, from Table A-14.
If cc 28 contains T:		
29-36	Blank	Leave blank.
37-54	Text Value	Enter the text value and any associated units as text.
For both cases (T and N):		
55-56	Analytical Method	Using the standard nomenclature in Table A-8, enter the two-character code for the chemical analysis method used.
57-64	High Detection Limit	Enter the upper detection limit of the analytical method in the form nn▲nn E ± nn.
65-72	Low Detection Limit	Enter the lower detection limit of the analytical method in the form nn▲nn E ± nn.
73-79	Detection Limit Units	Enter the upper and lower detection limit units as text from Table A-14.
80	Feed Material Sequence Number	Same as CARD FO.

GROUP F -- FUELS AND FEEDSTOCKS -- FORM 5

Card Column	Data Element	Encoding Instructions
CARD F5		
16	Chemical ID Type	Enter the chemical entry code which determines the type of chemical ID used. Enter the letter C for CAS number and M for MEG number. Unlimited cards may be added as needed.
17-26	Category/ Species ID	Enter the chemical ID for the organic category or species, from Table A-7.
27-28	Analytical Method	Enter the two-character code for the chemical analysis method, from Table A-8.
29-36	High Detection Limit	Enter the upper detection limit of the analytical method in the form nn▲nn E ± nn.
37-44	Low Detection Limit	Enter the lower detection limit of the analytical method in the form nn▲nn E ± nn.
45-52	Detection Limit Units	Enter the upper and lower detection limit units as text, from Table A-14.
53-60	Total Milligrams Recovered	Enter as a decimal number the total milligrams of the category/species found in the sample. The decimal point is indicated.
61	≶	If the actual concentration is indicated to be less than or greater than a value, enter the appropriate sign here. Otherwise, leave blank.
62-68	Actual Concentration	Enter the concentration of the category/species, in the form n▲nn E ± nn.
69-79	Actual Concentration Units	Enter units of actual concentration as text, from Table A-14.
80	Feed Material Sequence Number	Same as CARD F0.

GROUP F -- FUELS AND FEEDSTOCKS -- FORM 5

Card Column	Data Element	Encoding Instructions
CARDS F7, F8, and F9		
16-79	Comments	Enter comments regarding the analysis of the fuels and feedstocks, starting on CARD F7, as text.
80	Feed Material Sequence Number	Same as CARD F0.

GROUP H -- SAMPLING ACTIVITY DESCRIPTION -- FORM 6

Card Column	Data Element	Encoding Instructions
CARD HO		
12-13	Sample Number	Enter a sequential integer number for each sample, unique within each test ID. A sample is defined as the measurement or group of measurements taken with a single measurement method to define the composition of a stream at a given point in time. This number may be assigned serially at the time the data is encoded.
16	Blank	Leave blank.
17-46	Measurement Instrument/Method Name	Enter the name of the measurement instrument/method as text using the standard nomenclature given in Table A-9(b), and elaborate in comments if necessary. If not known, enter "NOT SPECIFIED".
47-50	Sampling Start Time	Enter the start time of the sample collection as a right-justified integer number using military time.
51-53	Sampling Duration	Enter the duration in minutes of the sample collection activity as a right-justified integer number.
54-57	Measured Stream Velocity	Enter as a decimal number the measured velocity of the gas stream in units of m/sec. The decimal point is indicated.
58-61	Measured Stream Temperature	Enter as an integer number the measured temperature of the gas stream in units of degrees Celsius.
62-64	Measured Stream Pressure	Enter as an integer number the measured absolute pressure of the gas stream at the sampling location in units of kPa.
65-67	Measured Stream Moisture Content	Enter as a decimal number the measured moisture content of the gas stream at the sampling location in units of percent by volume. The decimal point is indicated.
68-71	Blank	Leave blank.

GROUP H -- SAMPLING ACTIVITY DESCRIPTION -- FORM 6

Card Column	Data Element	Encoding Instructions
CARD H0 (cont.)		
72-76	Sample Volume	Enter as a decimal number the total gas volume collected for the sample in units of m^3. The decimal point is indicated.
77-80	Blank	Leave blank.
CARD H1		
16-21	Measured Stream Flowrate	Enter as a decimal number the measured total volumetric flowrate of the gas stream at the sampling location. The decimal point is indicated.
22-27	Flowrate Units	Enter as text the units of the gas stream flowrate from Table A-14.
28-47	Flowrate Measurement Method	Enter as text the technique or equipment which was used to determine the gas stream flowrate using the standard nomenclature provided in Table A-10.
48-52	Sample Total Mass	Enter as a decimal number the total mass of the sample collected. The decimal point is indicated.
53-54	Mass Units	Enter as text the units of the sample total mass from Table A-14.
55-80	Blank	Leave blank.
CARD H2		
16	Sampling Location Code	Enter the code letter for the sampling location as follows: I, inlet of control device/treatment process, or 0, outlet of control device/treatment process. If the source is uncontrolled, enter I.
17-18	Device/Process Number	Enter the integer number which identifies to which device or process the sampling location code refers. (See CARD D0, columns 16-17.)

GROUP H -- SAMPLING ACTIVITY DESCRIPTION -- FORM 6

Card Column	Data Element	Encoding Instructions
CARD H2 (cont.)		
19-48	Sampling Location Description	Describe the sampling location in terms of proximity to control devices and discharge points. Enter as text any information that affects the sampling and transport of discharges or emissions. Identify any sources of possible stratification. Be brief and use abbreviations. Expand into comments as necessary.
49-80	Blank	Leave blank.
OMIT CARDS H3 AND H4 ENTIRELY.		
CARD H5		
16-70	Collection Surface/ Substrate	Enter as text a description of any surface or substrate used for sampling. For instruments for which no collection surface is needed, encode NONE.
71-80	Blank	Leave blank.
CARDS H6, H7, H8, and H9		
16-80	Comments	Enter as text comments on the sampling activity.

GROUP K -- COMPONENT -- FORM 7

Card Column	Data Element	Encoding Instructions
CARD KO		
16-17	Component Sequence Number	Enter a sequential integer number for each component of the measurement method analyzed starting with the component nearest to the measurement method inlet.
18-29	Component Name	Enter the specific component of the sampling equipment as text. For example, the XAD-2 Resin in a SASS train could be a component name; or an impinger. Use abbreviations if necessary and clarify in comments on Form 6. If the sample is not split into components, enter "TOTAL SAMPLE".
30-33	Blank	Leave blank.
34	≶	If the component weight is indicated to be less than or greater than a value, enter the appropriate sign. Otherwise, leave blank.
35-41	Component Weight	Enter the component weight in milligrams, in the form n‸nn E ± nn.
42-80	Chemical Analysis Laboratory Name	Enter the name of the laboratory which performed the chemical analysis on the gas samples as text.
CARD K1		
16-17	Component Sequence Number	Same as CARD KO.
18-20	Chemical Lab QA/QC Code	Enter the QA/QC code for the chemical analysis laboratory, if known.
21-23	Radionuclide Laboratory QA/QC Code	Enter the QA/QC code for the radionuclide analysis laboratory, if known.

GROUP K -- COMPONENT -- FORM 7

Card Column	Data Element	Encoding Instructions
CARD K1 (cont.)		
24-63	Radiological Analysis Lab Name	Enter the name of the laboratory which performed the radionuclide analysis on the gas samples as text.
64-70	Component Aliquot Mass/Volume	Enter the mass or volume of the sample aliquot as a decimal number. The decimal point is indicated.
71-75	Aliquot Units	Enter the units of the sample aliquot as text, from Table A-14. These units will identify the aliquot as mass or volume.
76-80	Blank	Leave blank.
CARD K2		
16-17	Component Sequence Number	Same as CARD KO.
18-29	Effluent Parameter Name	Enter the name of the effluent parameter analyzed as text. This entry is intended to accommodate any quantitative measurement on the gas sample with the exception of organic and inorganic species measurements. Examples are opacity, alkalinity, pH, etc.
30	Value Type	Enter N if the parameter has a number value and T if it has a text value.
If cc 30 contains N:		
31-35	Number Value	Enter the value of the effluent parameter as a decimal number. The decimal point is indicated.
36-43	Value Units	Enter the value units of the effluent parameter as text, from Table A-14.
If cc 30 contains T:		
31-43	Text Value	Enter the value and any associated units as text.

GROUP K -- COMPONENT -- FORM 7

Card Column	Data Element	Encoding Instructions
CARD K2 (cont.)		
For both cases (T and N):		
44-45	Analytical Method	Enter the two-character code for the analysis method using the standard nomenclature provided in Table A-8.
46-53	High Detection Limit	Enter the upper detection limit of the analytical method in the form nn▲nn E ± nn.
54-60	Low Detection Limit	Enter the lower detection limit of the analytical method in the form n▲nn E ± nn.
61-69	Detection Limit Units	Enter the upper and lower detection limit units from Table A-14.
70-80	Blank	Leave blank.
CARDS K3 AND K4		
16-17	Component Sequence Number	Same as CARD K0.
18-80	Comments	Enter comments on the effluent characteristics as text.

GROUP L -- INORGANIC ANALYSIS/NON-LEVEL 1 ORGANIC ANALYSIS -- FORM 8

Card Column	Data Element	Encoding Instructions
CARD LO		
16-17	Component Sequence Number	Same as CARD KO.
18	ID Type	Enter the chemical entry code which determines the type of chemical ID used. Enter the letter C for CAS number and M for MEG number. Unlimited cards may be added as needed.
19-28	Category/ Species ID	Enter as text the inorganic or non-Level 1 organic species or compound ID for the appropriate chemical entry code. Use the standard nomenclature provided in Table A-7.
29-30	Analytical Method	Enter the two-character code for the appropriate analysis method using the standard nomenclature in Table A-8.
31-38	High Detection Limit	Enter the upper detection limit of the analytical method in the form nn▲nn E ± nn.
39-46	Low Detection Limit	Enter the lower detection limit of the analytical method in the form nn▲nn E ± nn.
47-54	Detection Limit Units	Enter as text the upper and lower detection limit units from Table A-14.
55-62	Total Milligrams Recovered	Enter as a decimal number the total milligrams of the species recovered from the sample analyzed. The decimal point is indicated.
63	$\lessgtr$	If the actual source concentration is indicated to be less than or greater than a value, enter the appropriate sign here. Otherwise, leave blank.
64-70	Actual Source Concentration	Enter the concentration of the species analyzed for this component in the form n▲nn E ± nn. Units are $\mu g/m^3$.
71-80	Blank	Leave blank.

GROUP L -- INORGANIC ANALYSIS/NON-LEVEL 1 ORGANIC ANALYSIS -- FORM 8

Card Column	Data Element	Encoding Instructions
CARDS L1 and L2		
16-17	Component Sequence Number	Same as CARD KO.
18-80	Comments	Enter inorganic/non-Level 1 organic analysis comments as text.

GROUP M -- LEVEL 1 ORGANIC ANALYSIS -- FORM 9

Card Column	Data Element	Encoding Instructions
CARD MO		
16-17	Component Sequence Number	Same as CARD KO.
18-20	Fraction ID	Enter as text the organic fraction determined by liquid chromatography per Level 1 analysis procedures and designated LC1-LC7. Enter TOT if the sample was not fractionated but TCO and GRAV were done on the whole sample. Unlimited cards may be added as needed.
21-26	TCO	Enter as a decimal number the total chromatographable organics (TCO) measured for each LC fraction in units of milligrams. The decimal point is indicated.
27-32	GRAV	Enter as a decimal number the weight in milligrams of each LC fraction determined by gravimetric analysis. The decimal point is indicated.
33	ID Type	The letter M is printed on the form as the chemical entry code which identifies the type of chemical ID used. The letter M is for MEG number.
34-43	Category/ Species ID	Enter as text the organic chemical category or organic chemical species. Enter the appropriate MEG ID number. Use standard nomenclature provided in Table A-7.
44-45	Analytical Method	Enter the two-character code for the appropriate analysis method using the standard nomenclature in Table A-8.
46-53	High Detection Limit	Enter the upper detection limit of the analytical method in the form nn▲nn E ± nn.
54-61	Low Detection Limit	Enter the lower detection limit of the analytical method in the form nn▲nn E ± nn.
62-69	Detection Limit Units	Enter as text the upper and lower detection limit units from Table A-14.

GROUP M -- LEVEL 1 ORGANIC ANALYSIS -- FORM 9

Card Column	Data Element	Encoding Instructions
CARD M0 (cont.)		
70-72	Intensity	Enter as a right-justified integer number the assigned intensity (in essence a weighting factor) used to indicate relative presence of chemical categories obtained from either infrared (IR) or low resolution mass spectrometry (LRMS) analysis data. Assigned intensity values, either 100, 10, or 1, are used to calculate concentration estimates. An intensity is assigned for each category in each LC fraction. Units are dimensionless.
73	≶	If the actual source concentration is indicated to be less than or greater than a value, enter the appropriate sign here. Otherwise, leave blank.
74-80	Actual Source Concentration	Enter in the form n▲nn E ± nn, the concentration of each category in each LC fraction for this component. These values are calculated from the assigned intensities. Units are $\mu g/m^3$.
CARDS M1 and M2		
16-17	Component Sequence Number	Same as CARD K0.
18-80	Comments	Enter comments on the Level 1 Organic Analysis as text.

GROUP R -- RADIONUCLIDE DATA -- FORM 10

Card Column	Data Element	Encoding Instructions
CARD R0		
16-17	Component Sequence Number	Same as CARD K0.
18-25	Radionuclide ID	Enter the name of the isotope assayed as text. The name is given as a symbol and mass number separated by a dash (e.g., RA-226, U-235, and BI-214). Unlimited cards may be added as needed.
26-27	Analytical Method	Enter the two-character code for the name of the assay (analysis) method as text using standard nomenclature provided in Table A-8.
28-35	High Detection Limit	Enter the upper detection limit of the assay method in the form nn▲nn E ± nn.
36-43	Low Detection Limit	Enter the lower detection limit of the assay method in the form nn▲nn E ± nn.
44-51	Detection Limit Units	Enter as text the upper and lower detection limit units from Table A-14.
52	≶	If the actual source concentration is indicated to be less than or greater than a value, enter the appropriate sign here. Otherwise, leave blank.
53-59	Actual Source Concentration	Enter the actual source concentration of the isotope for this component, in the form n▲nn E ± nn. Units are pCi/m^3.
60-80	Blank	Leave blank.
CARDS R1 AND R2		
16-17	Component Sequence Number	Same as CARD K0.
18-80	Comments	Enter radionuclide data comments as text.

GROUP T -- BIOASSAY DATA -- FORM 11

Card Column	Data Element	Encoding Instructions
CARD T0		
16-40	Test Type	Enter as text the name of the broad category of bioassay test type using the standard nomenclature provided in Table A-11.
41-70	Test Name	Enter as text the exact name of the bioassay test (a subset of Test Type) using the standard nomenclature provided in Table A-12.
71-76	Test Duration	Enter as a right-justified integer number the duration of the test in hours.
77-80	Lab Sample ID	Enter as a right-justified integer number the unique sample ID as assigned by the test lab.
CARD T1		
16-56	Test Lab Name	Enter the name of the bioassay testing laboratory as text.
57-59	Bioassay QA/QC Code	Enter the bioassay laboratory QA/QC code, if known.
60-65	Test Start	Enter the start date of the bioassay test as integer numbers in the form MM-DD-YY.
66-71	Test End	Enter the end date of the bioassay test as integer numbers in the form MM-DD-YY.
72-80	Blank	Leave blank.
CARD T2		
16-23	Sample Quantity	Enter as a right-justified integer number the value indicating the quantity of sample submitted for analysis.
24-29	Sample Quantity Units	Enter as text the units of the sample quantity submitted for analysis, from Table A-14.
30-80	Blank	Leave blank.

GROUP T -- BIOASSAY DATA -- FORM 11

Card Column	Data Element	Encoding Instructions
CARD T3		
16-80	Test Organisms/ Strains	Enter as text the name of the specific test organism used. Multiple entries are permitted for those assays in which more than one organism is used. For example, SALMONELLA TYPHIMURIUM TA-1538 and TA-98 may be used in the same Ames test. Standard nomenclature is provided in Table A-13. Unlimited cards may be added as needed. Enter one organism/strain per card.
CARD T4		
16-19	Type of Value	Depending on the assay, enter the value type, such as LD_{50}, EC_{50}, or LC_{50} as text.
20-26	Value	Enter the assay results value in the form n▲nn E ± nn.
27-34	Value Units	Enter the units of the assay results value as text from Table A-14.
35-41	High Confidence Limit	Enter the upper confidence limit of the assay results value in the form n▲nn E ± nn.
42-48	Low Confidence Limit	Enter the lower confidence limit of the assay results value in the form n▲nn E ± nn.
49-56	Maximum Applicable Dose (MAD)	Enter the technical limitation on the dose allowed in a particular assay. The units will vary according to the assay. For example, Ames MAD = 5 mg/plate, RAM MAD = 1 mg/ml, RODENT MAD = 10,000 mg/kg. Enter in the form n▲nnn E ± nn.
57-65	MAD Units	Enter the maximum applicable dose units as text from Table A-14.
66-79	Level of Toxicity	Enter HIGH, MODERATE, LOW, or NOT DETECTABLE as a qualitative expression of the bioassay results based upon a predefined range in LD_{50}, EC_{50}, or LC_{50}, etc.
80	Blank	Leave blank.

GROUP T -- BIOASSAY DATA -- FORM 11

Card Column	Data Element	Encoding Instructions
CARD T5		
16-29	Bacteria Mutagenicity Response	Enter POSITIVE or NEGATIVE to indicate the Ames test response.
30-36	Minimum Effective Concentration (MEC)	Enter the minimum effective concentration (MEC). If a positive response is obtained from an Ames test, the MEC is the minimum concentration that gives a positive response. Enter in the form n▲nn E ± nn.
37-43	Minimum Effective Concentration Units	Enter the units of the minimum effective concentration as text from Table A-14.
44-60	Approximate Concentration Factor	Enter the factor as text which accounts for any aliquot taken during the bioassay lab procedures. It does not refer to the process stream flow.
61-80	Blank	Leave blank.
CARD T9		
16-17	Line Number	Enter a sequential, right-justified integer line number (i.e., 1, 2, 3...). Unlimited cards may be added as needed.
18-80	Comments	Enter bioassay comments as text.

TABLE 4-1. ENGINEERING UNITS

Since computer encoding of units does not allow the use of Greek letters or lower case letters, the following protocol for the encoding of engineering units is defined:

Base Units	Encode
Ampere	A
Curie	CI
Day	DAY
Degree Celsius	C
Hour	HR
Gram	G
Joule	J
Liter	L
Meter	M
Metric ton	T
Mho (conductivity)	MHO
Minute	MIN
Ohm (resistance)	OHM
Pascal	PA
Percent	%
Percent by volume	% VOL
Percent by weight	% WT
Second	S
Watt	W

Adapted SI Prefixes

Factor	Prefix	SI Symbol	Encode
10^{18}	exa	E	E
10^{12}	tera	T	T
10^{9}	giga	G	G
10^{6}	mega	M	M6
10^{3}	kilo	k	K
10^{-2}	centi	c	C
10^{-3}	milli	m	M
10^{-6}	micro	μ	U
10^{-9}	nano	n	N
10^{-12}	pico	p	P

Special Prefixes	Encode
Actual	A
Dry normal	DN
Normal	N
Parts per	PP

TABLE 4-1. Concluded

Examples of Derived Units	Encode
Actual cubic meters	AM3
Centimeters	CM
Centimeters/second	CM/S
Cubic meters/second	M3/S
Dry normal cubic meters	DNM3
Grams per cubic centimeter (density)	G/CM3
Joule per hour	J/HR
Kilogram	KG
Kilograms of steam per hour	KG/HR
Kilojoules/kilogram (heat content)	KJ/KG
Kilopascals (kPa) (pressure)	KPA
Kilowatt	KW
Kilowatt-hour	KWH
Liters per second	L/S
Liters per minute	L/MIN
Megawatt	MW
Meters per second	M/S
Metric tons per day	T/DAY
Micrograms (μg)	UG
Microgram per cubic meter	UG/M3
Microgram per gram	UG/G
Microgram per liter	UG/L
Micro mho (conductivity)	UMHO
Micron (μm)	UM
Milligrams (mg)	MG
Milligrams per plate	MG/PLATE
Milligrams per milliliter	MG/ML
Milligrams per kilogram	MG/KG
Milliliter	ML
Normal cubic meters per minute	NM3/MIN
Parts per billion	PPB
Parts per million	PPM
Picocurie (pCi)	PCI
Picocuries per cubic meter	PCI/M3
Picocuries per gram	PCI/G
Picocuries per liter	PCI/L
Square centimeters (cm^2)	CM2
Square meters (m^2)	M2

TABLE 4-2. CONVERSION FACTORS TO METRIC UNITS

To Convert From:	To:	Multiply By:
acre	meter^2	4.05 E + 03
atmosphere	pascal	1.01 E + 05
barrel	meter^3	1.59 E - 01
Btu	joule	1.06 E + 03
Btu/hour	watt	2.93 E - 01
Btu/pound (mass)	kilojoule/kilogram	2.33 E + 00
Btu/second	watt	1.06 E + 03
calorie (International Table)	joule	4.19 E + 00
degree Fahrenheit	degree Celsius	(t_F-32) 5/9
foot	meter	3.05 E - 01
foot^2	meter^2	9.29 E - 02
foot^3	meter^3	2.83 E - 02
gallon	liter	3.79 E + 00
gallon	meter^3	3.79 E - 03
grain	milligram	6.48 E + 01
grain/foot^3	gram/meter^3	2.29 E + 00
horsepower (550 foot-pound force/second)	watt	7.46 E + 02
inch	centimeter	2.54 E + 00
inch	meter	2.54 E - 02
inch^2	meter^2	6.45 E - 04
inch^3	meter^3	1.64 E - 05
inch of mercury (60°F)	pascal	3.38 E + 03
inch of water (60°F)	pascal	2.49 E + 02
kilocalorie	joule	4.19 E + 03
kilowatt-hour	joule	3.60 E + 06
liter	meter^3	1.00 E - 03
mil	meter	2.54 E - 05
mile (U.S. Statute)	meter	1.61 E + 03
mile/hour	meter/second	4.47 E - 01
ounce (mass AVDP)	kilogram	2.83 E - 02
ounce (U.S. fluid)	meter^3	2.96 E - 05

TABLE 4-2. Concluded

To Convert From:	To:	Multiply By:
pint (U.S. liquid)	meter^3	4.73 E - 04
pound (mass AVDP)	kilogram	4.54 E - 01
pound/million Btu	nanogram/joule	4.30 E + 02
pound/inch^2 (psi)	pascal	6.89 E + 03
pound/foot^3	kilogram/meter^3	1.60 E + 01
pound (thousands)/hour	kilogram/second	1.26 E - 01
quart	liter	9.46 E - 01
quart	meter^3	9.46 E - 04
ton (long = 2240 pounds)	kilogram	1.02 E + 03
ton (short = 2000 pounds)	kilogram	9.07 E + 02
tonne (metric ton)	kilogram	1.00 E + 03
yard	meter	9.14 E - 01

SECTION 5

DATA SUBMITTAL

5.0 INTRODUCTION

The purpose of this section is to provide users of the GEDS with instructions for submitting new data for entry to the GEDS data base and to describe the quality assurance and quality control activities which will be performed on all data submitted. Previous sections in this User Guide have discussed how the sampling data are to be organized and encoded on the GEDS Data Input Forms. This section will provide the protocol for transferring the data from the data sheets to a form that can be read by the computer. Once this step is completed, instructions are given regarding to whom the data should be sent and what documentation should be provided. Next, the review cycle by the EADS Technical Support Staff is described. The function of the EDIT program and LOADER program is discussed, and the output of each program is described and interpreted.

5.1 DATA INPUT FORM PROCESSING

The GEDS data input forms are designed to be entered into the computer initially as 80-character records either as computer cards or card images that can be interpreted by the UNIVAC U-1100 computer. It is the responsibility of the submittor to ensure that the data are keypunched and verified. The character set to be used should be compatible with the IBM 029 set.

Cards should be segregated by Test Series Number (TSN) and should be packaged in boxes (if they are to be mailed). Data may be submitted on magnetic tape; however, before attempting to do so, the user should contact the EADS Program Manager for guidance. The manner in which computer tapes are formatted and read varies widely; thus, each tape submittal must be handled differently. The EADS Technical Support Staff will coordinate information between the user and the National Computer Center staff to ensure that the user's tape will be compatible with the UNIVAC U-1100. Magnetic tapes to be mailed should be packaged properly in specially-designed tape containers for shipment. Such containers are generally available in most data centers.

When the data input forms have been converted into a machine-readable format for the computer, the submittor should retain the data forms for reference until the test series has been loaded into the data base.

5.2 SUBMITTAL PROCEDURES

All data in machine-readable format (usually cards) should be sent to the EADS Program Manager accompanied by a cover letter that describes each test series submitted. A sample cover letter is given in Figure 5-1. The complete address is as follows:

Gary L. Johnson
EADS Program Manager
Industrial Environmental Research Laboratory
U.S. Environmental Protection Agency
Mail Drop 63
Research Triangle Park, NC 27711

REMINDER: No test series should be submitted until it has been assigned a unique Test Series Number (TSN) by the EADS Program Manager. As described in Section 4, the TSN must be encoded in columns 2-6 on each card submitted. If a permanent TSN has not been assigned, then the encoder should write or call the EADS Program Manager prior to submitting the data.

Once the data have been received, the encoder will be sent a letter acknowledging receipt of the data and notifying him that EDIT processing of the data has commenced. A sample acknowledgement letter is given in Figure 5-2.

In some cases, EADS users will have the facilities available to directly submit the test series cards to the National Computer Center. This is allowed; however, the submittor should contact the EADS Program Manager for technical guidance prior to doing so.

Gary L. Johnson
EADS Program Manager
Industrial Environmental Research Laboratory
Mail Drop 63
Research Triangle Park, NC 27711

Dear Mr. Johnson:

Enclosed you will find punched cards for FPEIS Test Series 200, GEDS Test Series 27, LEDS Test Series 352, and SDDS Test Series 14. These test series represent multimedia sampling performed at a confidential power plant site as part of EPA Contract No. 68-02-9999.

Very truly yours,

John A. Doe, Ph.D.
Ozone National Laboratory

Enclosure

Figure 5-1. Sample data submittal letter.

Dr. John A. Doe
Ozone National Laboratory
1234 Anystreet Drive
Hometown, CA 99999

Dear Dr. Doe:

This letter is to acknowledge our receipt of source testing data for the following data bases and test series: FPEIS TSN 200, GEDS TSN 27, LEDS TSN 352, and SDDS TSN 14.

In a short time, you will be contacted by the EADS Technical Staff regarding any corrections to the data that may be required prior to loading the data into the appropriate media data base.

Thank you very much for your support of the EADS. If you have any questions, please feel free to call me at (919) 541-2745.

Very truly yours,

Gary L. Johnson
EADS Program Manager (MD-63)

Figure 5-2. Sample data submittal acknowledgement letter.

5.3 REVIEW AND CORRECTIVE ACTION PROCEDURES

The responsibility for determining the validity of the data submitted lies with the encoder; however, the EADS Technical Staff will assist the encoder by identifying errors that must be corrected before the data can be loaded into the data base.

Upon receipt of the card deck (or decks) submitted by the encoder, the EADS Program Manager's office will load the cards into a card-image file on the UNIVAC U-1100 computer at Research Triangle Park, NC. The appropriate EADS Technical Staff persons will be notified that a new test series has been received and that quality assurance (QA) activities may begin for that test series.

The EADS QA activities are shown schematically in Figure 5-3. The test series received will be processed through the EADS EDIT program which will produce a SERIES Report-format listing of the input data, a list of all errors detected, and a list of all cards contained in the test series. The EDIT program is described in detail in Section 5.4 which follows. Initially, the EADS Technical Staff will review the EDIT report and will identify any obvious errors. These errors will be corrected by the Technical Staff and a new EDIT report will be produced. It should be noted that by "obvious errors" we are referring to errors such as encoding, keypunching, or spelling errors, etc. The Technical Staff cannot and will not attempt to correct any data with respect to accuracy or validity, or otherwise pass engineering judgment on the submitted data, etc. Any errors in measurement data or descriptive data must be identified and corrected by the encoder of the data.

The corrected EDIT report will be mailed to the encoder for his review. Any changes to the data should be marked legibly on the

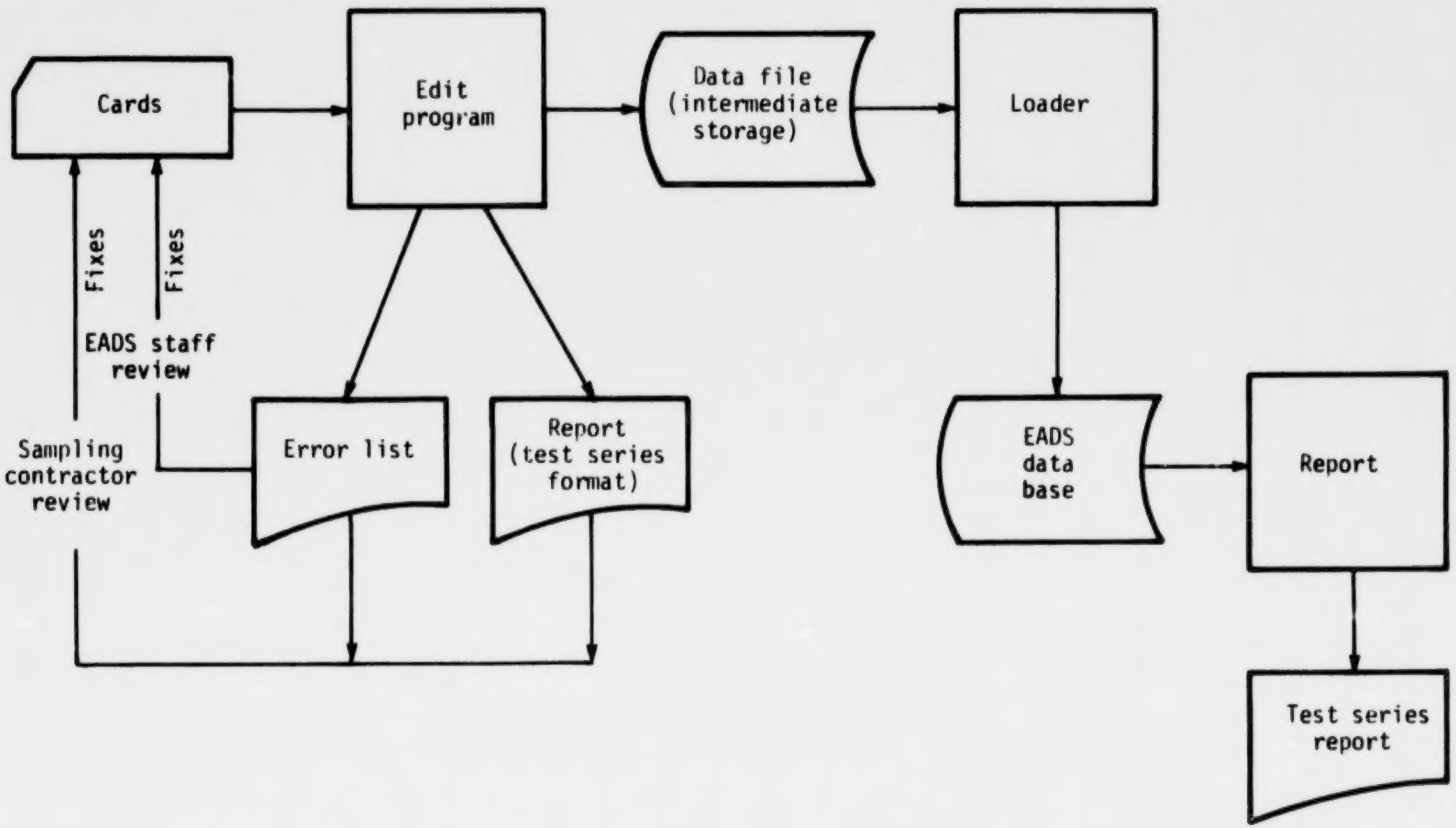
Cards
Edit program
Data file (intermediate storage)
Loader
Fixes
Fixes
EADS staff review
Sampling contractor review
Error list
Report (test series format)
EADS data base
Report
Test series report

Figure 5-3. QA procedure.

printout. Telephone interaction with the EADS Technical Staff to answer questions, or to clarify data as they are encoded, is encouraged. The marked EDIT report with the corrections should be returned to the Technical Staff promptly. The Technical Staff will implement the recommended changes and will produce another EDIT report. If no errors are detected, the EDIT report will be returned to the encoder for final verification. If the encoder is satisfied that the data are correct (and valid) as submitted, then he should notify the Technical Staff that the data are ready to load into the data base. If any errors remain after review by the encoder, the changes should again be marked on the EDIT report and it should be returned to the Technical Staff. This corrective action QA cycle will be repeated until the submittor okays the data for data base entry. No data will be loaded until encoder approval is obtained.

Once final approval of the data is received from the submittor, the test series is processed through the LOAD program, which actually loads the sampling activity results into the SYSTEM 2000® data base management structure described in Section 2. The specific details of the LOAD program are given in Section 5.4, following.

When the test series has been loaded into the data base, a copy of the SERIES report (see Section 7) will be sent to the submittor to acknowledge the event. At this point, the contents of the test series are available to be compared with any other data contained in the data base; that is, only now will the test series be available for public access.

5.4 EDIT/LOAD PROGRAMS

5.4.1 EDIT Program

The EADS EDIT program provides three functions on the data being submitted for entry to the EADS data base. First, it processes and lists all input cards for a test series, duplicating or filling data fields on cards as instructed by the Repetitive Data Feature protocol (described in Section 4). Second, the EDIT program produces a report that is formatted similarly to the SERIES Report, which allows visual editing to be done in a format familiar to the user. Third, the program performs values and range checks on input data fields, such as those fields that require standard nomenclature, and lists any errors detected. The EDIT program does not replace actual reviewing of the data by the EADS Technical Staff or, more importantly, by the submittor of the data.

An example EADS EDIT is given in Figure 5-4. Each page in the SERIES report format has the form number given in the upper right corner that identifies the data input form on which the data were encoded. It should be noted that in the SERIES report format all analytical codes have been translated into the full description and all chemical ID's have been expanded to report both the MEG ID and the CAS Number, the chemical preferred name and any synonyms, and the chemical formula. The EDIT report reflects the data as they are encoded, that is, the format follows the pyramid structure form by form. This means that the chemical data (Non-Level 1 Organic/Inorganic and Level 1 Organic) at the SAMPLE level in the data base are summarized by COMPONENT. The actual SERIES report differs from this in that the chemical data are summarized by chemical species (or Level 1 fraction). The same is true for the radionuclide data. The EADS user should refer to Section 7 for more details on the SERIES report.

Following the listing of the input in the SERIES (EDIT) format, a summary of administrative data is presented on the TEST SERIES. The submittor is identified as well as the sponsor, contract number, etc. The principal milestones in the EDIT review cycle are documented.

After the administrative data, all of the input cards are listed and numbered sequentially as received. This provides an easy reference to the card images when errors are found. The EADS Technical Staff will correct any errors in this card image file using the UNIVAC Text Editor, which allows on-line changes to be made.

Following the listing of the input data cards, the ERROR file is printed. The ERROR file contains a list of all of the errors detected by the EDIT program. For each input card on which an error is found, the card number and entire card text are printed, the error number is given, the type of error (F = fatal or W = warning) is given, the data base component number affected is shown, and the error message is listed. The complete list of error messages is given in Appendix A.1. The format for the ERROR file data is shown below:

```
15        F000110100101K001
          No.    Type    Component    Message
          163     F        C1305      Component Name Missing
```

The user may refer to the Glossary of Data Elements in Appendix A.3 for a complete description of the component number. It should be noted that the ERROR file will only identify those fields left out or those having standard nomenclature to which comparisons may be made. As stated previously, the ERROR file does not replace visual checking of the data by the Technical Staff or validation of the data by the submittor.

5.4.2 LOAD Program

After the data have been reviewed completely and have been approved for data base entry, the LOAD program is used to enter the test series into the data base. Loading of the data base is accomplished by the EADS Technical Staff. The LOAD program has no specific output like the EDIT program. Verification of data loading is made by the Technical Staff by checking the data base. Successful completion of the loading process will be acknowledged to the submittor of the data by his receipt of the SERIES report print-out.

The operation of the LOAD program is basically simple. The expanded EDIT-LOAD file is the input file to the LOAD program. The file is segmented into blocks of data which represent the principal levels of the data base structure. Using the Test Series Number, Stream Number, Sample Number, and Component Number as indices, the data are loaded into the SYSTEM 2000® pyramid structure through a mechanism called Procedure Language Interface (PLI), a major feature of SYSTEM 2000®. The reader is referred to the appropriate SYSTEM 2000® documentation for a complete discussion of the PLI feature.

```
                                       GEDS  SERIES REPORT                                   PAGE      1
                                   --------------------------------                 FORM 1   DATE 04/02/80
TEST SERIES NO:   101  DESCRIBES SAMPLING AT SITE FROM 08/27/77 TO 09/01/77 BY ACUREX

                       SPONSOR ORGANIZATION:   EPA
                       CONTRACT NUMBER:        68-02-2160
                       TASK/DIRECTIVE NUMBER:  123

SOURCE DESCRIPTION------------------------------

                 SOURCE CATEGORY:         COMBUST-ENERGY             SOURCE NAME:   UNIT A
                 SOURCE TYPE:             UTILITY                    SITE NAME:     KINGSTON STEAM PLANT
                 PRODUCT/DEVICE:          BOILER                     ADDRESS:
                 PROCESS TYPE:            TANGENTIAL                                KINGSTON           ,TN     27607  USA
                 DESIGN PROCESS RATE:       200   MW                 NPDES NUMBER:  00000
                 FEED MATERIAL CATEGORY:    COAL

EADS WASTE STREAM DATA BASES--------------------

                 WASTE STREAM DATA FROM OTHER MEDIA WHICH WERE COLLECTED CONCURRENTLY WITH THIS TEST SERIES
                 ARE AS FOLLOWS(TEST SERIES NUMBER-TSN):

                     FPEIS TSN: 00103    LEDS TSN: 00102    GEDS TSN: 00000    SDDS TSN: 00100

REFERENCE REPORT---------------------------------

                 TITLE
                 AUTHOR
                 SPONSOR REPORT NUMBER     NTIS NUMBER          PUBLICATION DATE
                 ------------------------------------------------------------------
                 FIELD TESTING OF A TANGENTIAL COAL-FIRED UTILITY BOILER--
                 EFFECTS OF COMBUSTION MODIFICATION NOX CONTROL ON MULTIMEDIA EMIS
                 HIGGEBOTHAM E B
                 ACUREX REPORT 79-337                           APRIL 1979

TEST SERIES COMMENTS-----------------------------
                    01 LEVEL 1 TESTING FOR EFFECTS DUE TO NOX COMBUSTION MODIFICATIONS
                    02 TEST #1 BASELINE
                    03 TEST #2 BURNERS OUT OF SERVICE
                    04 TEST #3 BIASED FIRING
```

Figure 5-4. Sample EDIT outnut.

```
TEST SERIES NO: 00101    STREAM NO: 01                                                                        PAGE        2
                                                                                                     FORM 2    DATE 04/02/80

EFFLUENT STREAM DESIGN CHARACTERISTICS-----------

      STREAM NAME: BOILER FLUE GAS

      STREAM DESIGN DATA AT SOURCE

              MOISTURE CONTENT=  3.4 PCT   MASS/VOLUMETRIC FLOW RATE=   123.4  M3/SEC   VELOCITY=  45.6 M/S

              TEMPERATURE=  100 C    PRESSURE=  1.20 KPA        STACK HEIGHT=  100.1 METERS

      COMMENTS:       FLUE GAS INLET TO ID FAN
                      SIGNIFICANT PITTING NOTED IN ID FAN BLADES.


CONTROL/TREATMENT SYSTEM CHARACTERISTICS-----

      DEVICE  01

              GENERIC SYSTEM TYPE:      MECHANICAL COLLECTOR               DEVICE CLASS:     CONVENTIONAL
              DESIGN TYPE:              CYCLONES                           COMMERICAL NAME:  DUSKOLECTOR
              SPECIFIC PROCESS/DEVICE:  DUSKOLECTOR                        MANUFACTURER:     DUSKOLECTOR,INC.
              DEVICE/PROCESS CATEGORY KEYWORDS:  01   HIGH PRESSURE
                                                 02   LOW ENERGY
                                                 03   STAINLESS STEEL




              DEVICE/PROCESS DESIGN PARAMETERS:  01   PRESSURE DROP                    2.60E+00 KPA
                                                 02   DESIGN EFFICIENCY                9.00E+01 % AT 100 M3
                                                 03   DESIGN TEMPERATURE               150-250 C
                                                 04   DESIGN FLOW RATE                 1.00E+02 M3/S
                                                 05   DESIGN POWER CONSUMPTION         1.50E+00 KWH



      DEVICE  02

              GENERIC SYSTEM TYPE:      ESP                                DEVICE CLASS:     CONVENTIONAL
              DESIGN TYPE:              SINGLE STAGE ESP                   COMMERICAL NAME:  R/C MODEL 16A
              SPECIFIC PROCESS/DEVICE:  PLATE                              MANUFACTURER:     RESEARCH-COTTRELL
              DEVICE/PROCESS CATEGORY KEYWORDS:  01   HOTSIDE
                                                 02   DRY
                                                 03   HI VOLTAGE



              DEVICE/PROCESS DESIGN PARAMETERS:  01   PLATE AREA                       2.00E+02 M2
```

```
02   PLATE-PLATE SPACING           1.25E+00 CM
03   DESIGN MASS EFFICIENCY        98 %
04   BULK LINEAR VELOCITY          2.80E+01 M/S
05   DESIGN PRESSURE DROP          5.49E-01 KPA
```

```
TEST SERIES NO: 00101    STREAM NO: 01                                                                     PAGE        3
                                                                                                 FORM 2A   DATE 04/02/80


CONTROL/TREATMENT SYSTEM CHARACTERISTICS-----

     DEVICE  03

            GENERIC SYSTEM TYPE:      LIQUID SCRUBBERS                DEVICE CLASS:     PILOT
            DESIGN TYPE:              ABSORPTION PROCESSES            COMMERICAL NAME:  MAG-OX SCRUBBER
            SPECIFIC PROCESS/DEVICE:  MAGNESIUM OXIDE                 MANUFACTURER:     TAKAHASHI ALI, LTD
            DEVICE/PROCESS CATEGORY KEYWORDS:  01   MECHANICAL AIDED
                                               02   MOVING BED



            DEVICE/PROCESS DESIGN PARAMETERS:  01   DESIGN PRESSURE DROP            5.88E-01 KPA
                                               02   INLET GAS VELOCITY              5.50E+01 M/S
                                               03   DESIGN LIQUID LOADING           6.50E+01 L/M3
                                               04   DESIGN EFFICIENCY               90 %
```

```
TEST SERIES NO: 00101    STREAM NO: 01    TEST ID NO: 001
                                                                                          PAGE         4
                                                                                  FORM 3  DATE 04/02/80

SOURCE/PROCESS CONDITIONS DATA-----------------

     TEST CONDITIONS

            TEST DATE: 08/30/77    TEST START TIME: 0012   FINISH TIME: 0100

            SOURCE OPERATING MODE:  CONTINUOUS STEADY STATE           PERCENT OF DESIGN CAPACITY=  89.0


     CONTROL SYSTEM OPERATING PARAMETERS

            DEVICE  01
                            01    POWER CONSUMPTION                 1.25E+00 KWH
                            02    PRESSURE DROP                     8.50E-01 KPA


     CONTROL SYSTEM OPERATING PARAMETERS

            DEVICE  02
                            01    PRESSURE DROP                     4.50E-01 KPA
                            02    INLET GAS VELOCITY                1.25E+01 M/S
```

```
TEST SERIES NO: 00101    STREAM NO: 01    TEST ID NO: 001                                                          PAGE        5
                                                                                                           FORM 4    DATE 04/02/80

FUELS AND FEEDSTOCKS CHARACTERISTICS-----------

      SOURCE FUEL/FEED MATERIAL:  COAL                               FEED MATERIAL RATE:  8.66 KG/SEC

      NAME OF ANALYTICAL LABORATORY:  COMMERCIAL TESTING AND ENGINEERING CO.      QA AUDIT CODE:    026

      SAMPLE MASS:  1.50  KG     SAMPLE VOLUME:  3.45  M3

      PROXIMATE ANALYSIS:
                                     MOISTURE                2.0 %WT
                                     ASH                    19.6 %WT
                                     VOLATILE MATTER        31.8 %WT
                                     FIXED CARBON           46.5 %WT
                                     SULFUR                  2.2 %WT
                                     HEAT CONTENT        36288. J/G

       ULTIMATE ANALYSIS:            PARAMETER     PERCENT BY WEIGHT
                                     ---------     -----------------
                                      CARBON           63.1
                                      HYDROGEN          4.3
                                      SULFUR            2.2
                                      NITROGEN           1.4
                                      ASH              19.6
                                      MOISTURE          2.0
                                      OXYGEN             7.3

      CHARACTERISTICS:
                                                                                 HIGH      LOW     DETECTION
                                                                              DETECTION DETECTION  LIMIT
          PARAMETER     ANALYTICAL METHOD                                      LIMIT     LIMIT     UNITS     VALUE    UNITS
          ------------  -----------------------------------------------------  --------  --------  --------  ------  --------
          DENSITY       OTHER(SEE FUEL AND FEEDSTOCK COMMENTS)                                                  2.5   G/CM3
          PH            WET CHEMICAL ANALYSIS (NOT SPECIFIED)                  1.40E+01  1.50E-01                8.5
          COLOR         OTHER(SEE FUEL AND FEEDSTOCK COMMENTS)                                               BLACKISH GRAY
```

```
TEST SERIES NO: 00101    STREAM NO: 01    TEST ID NO: 001                                                      PAGE        6
                                                                                                      FORM 5    DATE 04/02/80


FUELS AND FEEDSTOCKS CHARACTERISTICS CONTD------

  CHEMICAL ANALYSIS:  THE CHEMICAL DATA ARE LISTED IN THE FOLLOWING ORDER

      MEG NUMBER  CAS NUMBER  PREFERRED CHEMICAL NAME                          EMPIRICAL FORMULA            TOTAL       CONCEN-
                              OTHER NAME COMMONLY USED                                                      MG           TRATION
                              ANALYTICAL METHOD                                DETECTION LIMITS             RECOVERED   (UG/M3)
      ----------  ----------  ----------------------------------------------  --------------------------  ---------   ---------

         36       07440-39-3  BARIUM- FREE AND COMBINED                        BA                             12.123   >1.20E+02
                              BARIUM- FREE AND COMBINED
                              ATOMIC ABSORPTION SPECTROMETRY                   3.00E+03  5.00E-04  MG

         32       07440-41-7  BERYLLIUM- FREE AND COMBINED                     BE                             11.543    1.40E+00
                              GLUCINIUM
                              BERYLLIUM- FREE AND COMBINED
                              ATOMIC ABSORPTION SPECTROMETRY                   3.00E+03  5.00E-04  MG

         37       07440-42-8  BORON- FREE AND COMBINED                         B                                        1.00E+00
                              BORON- FREE AND COMBINED
                              ATOMIC ABSORPTION SPECTROMETRY

         68       07440-47-3  CHROMIUM- FREE AND COMBINED                      CR                                       2.60E+01
                              CHROMIUM- FREE AND COMBINED
                              ATOMIC ABSORPTION SPECTROMETRY

         74       07440-48-4  COBALT- FREE AND COMBINED                        CO                                       8.60E+00
                              COBALT- FREE AND COMBINED
                              ATOMIC ABSORPTION SPECTROMETRY

         72       07439-89-6  IRON- FREE AND COMBINED                          FE                                       6.40E+03
                              IRON- FREE AND COMBINED
                              ATOMIC ABSORPTION SPECTROMETRY

         46       07439-92-1  LEAD- FREE AND COMBINED                          PB                                       1.40E+01
                              LEAD- FREE AND COMBINED
                              ATOMIC ABSORPTION SPECTROMETRY

         71                   MANGANESE- FREE AND COMBINED                     MN                                       1.70E+01
                              MANGANESE- FREE AND COMBINED
                              ATOMIC ABSORPTION SPECTROMETRY

         76       07440-02-0  NICKEL- FREE AND COMBINED                        NI                                       6.00E-01
                              NICKEL- FREE AND COMBINED
                              ATOMIC ABSORPTION SPECTROMETRY

      FUELS AND FEEDSTOCKS COMMENTS:
                                      SAMPLE TAKEN 5 METERS ABOVE GROUND LEVEL.
                                      BELOW 5-METER LEVEL WAS FROM DIFFERENT SOURCE.
```

```
TEST SERIES NO: 00101    STREAM NO: 01    TEST ID NO: 001    SAMPLE NO: 01                                               PAGE        7
                                                                                                                FORM 6    DATE 04/02/80

SAMPLING ACTIVITY DESCRIPTION-------------------

      MEASUREMENT INSTRUMENT/METHOD NO: 00  NAME: SASS TRAIN WITH/CYCLONES         SAMPLING START TIME: 1234   DURATION:   1 MIN

      SAMPLING CONDITIONS-- MASS/VOLUMETRIC FLOWRATE=     1.2 L/S      FLOWRATE METHOD: PITOT TUBE            TEMPERATURE=   45 C

                            MOISTURE CONTENT= 6.6 PCT    VELOCITY=  12.3 M/SEC   PRESSURE=  46 KPA

                            SAMPLE DENSITY=     G/CM3   DENSITY DETERMINATION: MEASURED




COMMENTS ON THE SAMPLING ACTIVITY---------------

                            THE IMPINGERS WERE COMBINED.
```

```
TEST SERIES NO: 00101    STREAM NO: 01    TEST ID NO: 001    SAMPLE NO: 01   COMPONENT NO: 01                          PAGE        8
                                                                                                          FORM 7    DATE 04/02/80

COMPONENT NAME: EAD-2 CARTDG     STAGE/FILTER CUT SIZE:       UM     MASS: 1.23E+01 UG/M3

CHEMICAL LABORATORY QA AUDIT CODE: 024          RADIOLOGICAL LABORATORY QA AUDIT CODE: 019

RADIOLOGICAL ANALYSIS LABORATORY NAME: FONDA NUCLEAR LABS

COMPONENT (ALIQUOT)VOLUME:    1.230  MG

EFFUENT CHARACTERISTIC SUMMARY----------------------

                                                                       HIGH      LOW     DETECTION
                                                                    DETECTION DETECTION  LIMIT
      PARAMETER    ANALYTICAL METHOD                                  LIMIT     LIMIT    UNITS     VALUE     UNITS
     ------------  -----------------------------------------------  --------  --------  --------  --------  --------
      PH           WET CHEMICAL ANALYSIS (NOT SPE                                                 5.6-6.3


      COMMENTS:   NO WIND SPEED MEASUREMENTS WERE MADE.
```

```
TEST SERIES NO: 00101    STREAM NO: 01    TEST ID NO: 001    SAMPLE NO: 01    COMPONENT NO: 01
                                                                                          PAGE         9
                                                                                  FORM 9  DATE  04/02/80
LEVEL 1 ORGANIC EXTRACTION SUMMARY----------------

      THE EXTENDED CHEMICAL DATA ARE GIVEN IN FOLLOWING ORDER:

MEG NUMBER    CATEGORY/SPECIES NAME
                                                           FRACTION    INTENSITY    ESTIMATED
                                                              ID                    CONCENTRATION
              ANALYTICAL METHOD                                                      (UM/M3)
              HIGH/LOW DETECTION LIMITS AND UNITS
----------    --------------------------------------------  --------   ---------    ------------

   01         ALIPHATIC HYDROCARBONS                          LC1             10     1.00E-06
              GAS CHROMATOGRAPHY/MASS SPECTROMETRY
              1.00E+05    1.00E-06   MG

   08         CARBOXYLIC ACIDS AND DERIVATIVES                LC2             10    <1.22E-04
              GAS CHROMATOGRAPHY/MASS SPECTROMETRY
              1.00E+05    1.00E-04   MG

   12         NITROSAMINES                                    LC3            100     1.02E-01
              GAS CHROMATOGRAPHY/MASS SPECTROMETRY
              1.00E+05    1.00E-06   MG

   16         HALOGENATED AROMATIC COMPOUNDS                  LC4             10    <1.22E-04
              GAS CHROMATOGRAPHY/MASS SPECTROMETRY
              1.00E+05    1.00E-04   MG

   11         AZO COMPOUNDS, HYDRAZINE DERIVATIVES            LC5             10     1.47E-02
              GAS CHROMATOGRAPHY/MASS SPECTROMETRY
              1.00E+05    1.00E-04   MG

   14         SULFONIC ACIDS AND ESTERS, SULFOXIDES           LC6            100     1.29E-01
              GAS CHROMATOGRAPHY/MASS SPECTROMETRY
              1.00E+05    1.00E-06   MG

   18         PHENOLS                                         LC7            100     1.36E-04
              GAS CHROMATOGRAPHY/MASS SPECTROMETRY
              1.00E+05    1.00E-04   MG


                             LC1        LC2        LC3        LC4        LC5        LC6        LC7        SUM
                         ---------- ---------- ---------- ---------- ---------- ---------- ---------- ----------
     TOTAL ORGANICS  (MG)        2.5        2.6        3.0        2.6        2.7        2.9        2.9       19.2
     TCO             (MG)        1.2        1.2        1.7        1.2        1.2        1.2        1.2        8.9
     GRAV            (MG)        1.3        1.4        1.3        1.4        1.5        1.7        1.7       10.3


COMMENTS:

        REPLICATE SETS RUN ON ALL FRACTIONS.
```

```
TEST SERIES NO: 00101    STREAM NO: 01    TEST ID NO: 001    SAMPLE NO: 01   COMPONENT NO: 01                           PAGE        10
                                                                                                              FORM 10   DATE 04/02/80
RADIONUCLIDE DATA SUMMARY-------------------------

                                                                                                  HIGH        LOW      DETECTION
                 CONCENTRATION                                                                DETECTION   DETECTION    LIMIT
   RADIONUCLIDE     (PCI/M3)     ANALYTICAL METHOD                                               LIMIT       LIMIT       UNITS
   ------------  -------------  ---------------------------------------------------------   ---------   ---------   --------
      KR-85        <1.33E-05    NEUTRON ACTIVATION ANALYSIS                                  1.00E+10    1.00E-05    PCI/M3
     XE-133M        4.32E-02    NEUTRON ACTIVATION ANALYSIS                                  1.00E+10    1.00E-05    PCI/M3
     XE-133        <5.00E-05    NEUTRON ACTIVATION ANALYSIS                                  1.00E+10    1.00E-05    PCI/M3
     XE-135         4.32E-02    ATOMIC ABSORPTION SPECTROMETRY                               1.00E+10    1.00E-05    PCI/M3

               COMMENTS:         KR CONCENTRATION MAY BE ARTIFICIALLY HIGH.
```

```
TEST SERIES NO: 00101    STREAM NO: 01    TEST ID NO: 001    SAMPLE NO: 01   COMPONENT NO: 02                  PAGE        11
                                                                                                   FORM 7    DATE 04/02/80

COMPONENT NAME: IMPINGERS        STAGE/FILTER CUT SIZE:       UM     MASS: 1.13E+02 UG/M3

CHEMICAL LABORATORY QA AUDIT CODE: 024           RADIOLOGICAL LABORATORY QA AUDIT CODE: 019

RADIOLOGICAL ANALYSIS LABORATORY NAME: FONDA NUCLEAR LABS

COMPONENT (ALIQUOT)VOLUME:     1.230  MG

EFFUENT CHARACTERISTIC SUMMARY----------------------

                                                                        HIGH      LOW     DETECTION
                                                                     DETECTION DETECTION  LIMIT
      PARAMETER     ANALYTICAL METHOD                                  LIMIT     LIMIT     UNITS     VALUE     UNITS
     ------------   --------------------------------------------------  --------  --------  --------  --------  --------
     PH             WET CHEMICAL ANALYSIS (NOT SPE                                                   5.6-6.3


     COMMENTS:    NO WIND SPEED MEASUREMENTS WERE MADE.
```

```
TEST SERIES NO: 00101    STREAM NO: 01    TEST ID NO: 001    SAMPLE NO: 01   COMPONENT NO: 02                    PAGE        12
                                                                                                   FORM 9     DATE 04/02/80

LEVEL 1 ORGANIC EXTRACTION SUMMARY----------------

       THE EXTENDED CHEMICAL DATA ARE GIVEN IN FOLLOWING ORDER:

MEG NUMBER     CATEGORY/SPECIES NAME                                        FRACTION      INTENSITY     ESTIMATED
                                                                               ID                       CONCENTRATION
               ANALYTICAL METHOD                                                                         (UM/M3)
               HIGH/LOW DETECTION LIMITS AND UNITS
----------    ---------------------------------------------------          --------      ---------     -------------

  01          ALIPHATIC HYDROCARBONS                                          LC1               10       1.00E-06
              GAS CHROMATOGRAPHY/MASS SPECTROMETRY
              1.00E+05     1.00E-06    MG

  08          CARBOXYLIC ACIDS AND DERIVATIVES                                LC2               10      <1.22E-04
              GAS CHROMATOGRAPHY/MASS SPECTROMETRY
              1.00E+05     1.00E-04    MG

  12          NITROSAMINES                                                    LC3              100       1.02E-01
              GAS CHROMATOGRAPHY/MASS SPECTROMETRY
              1.00E+05     1.00E-06    MG

  16          HALOGENATED AROMATIC COMPOUNDS                                  LC4               10      <1.22E-04
              GAS CHROMATOGRAPHY/MASS SPECTROMETRY
              1.00E+05     1.00E-04    MG

  11          AZO COMPOUNDS, HYDRAZINE DERIVATIVES                            LC5               10       1.47E-02
              GAS CHROMATOGRAPHY/MASS SPECTROMETRY
              1.00E+05     1.00E-04    MG

  14          SULFONIC ACIDS AND ESTERS, SULFOXIDES                           LC6              100       1.29E-01
              GAS CHROMATOGRAPHY/MASS SPECTROMETRY
              1.00E+05     1.00E-06    MG

  18          PHENOLS                                                         LC7              100       1.36E-04
              GAS CHROMATOGRAPHY/MASS SPECTROMETRY
              1.00E+05     1.00E-04    MG


                                  LC1        LC2        LC3        LC4        LC5        LC6        LC7        SUM
                               ---------- ---------- ---------- ---------- ---------- ---------- ---------- ----------

                TOTAL ORGANICS  (MG)       2.5        2.6        3.0        2.6        2.7        2.9        2.9       38.4

                TCO             (MG)       1.2        1.2        1.7        1.2        1.2        1.2        1.2       17.8

                GRAV            (MG)       1.3        1.4        1.3        1.4        1.5        1.7        1.7       20.6


COMMENTS:
              REPLICATE SETS RUN ON ALL FRACTIONS.
```

```
TEST SERIES NO: 00101    STREAM NO: 01    TEST ID NO: 001    SAMPLE NO: 01   COMPONENT NO: 02                         PAGE        13
                                                                                                            FORM 10   DATE 04/02/80

RADIONUCLIDE DATA SUMMARY-------------------------
                                                                                                 HIGH         LOW       DETECTION
                       CONCENTRATION                                                          DETECTION   DETECTION     LIMIT
      RADIONUCLIDE       (PCI/M3)      ANALYTICAL METHOD                                         LIMIT       LIMIT       UNITS
      ------------    ------------     --------------------------------------------------    ---------   ---------   --------
        KR-85           <1.33E-05      NEUTRON ACTIVATION ANALYSIS                            1.00E+10    1.00E-05    PCI/M3
        XE-133M          4.32E-02      NEUTRON ACTIVATION ANALYSIS                            1.00E+10    1.00E-05    PCI/M3
        XE-133          <5.00E-05      NEUTRON ACTIVATION ANALYSIS                            1.00E+10    1.00E-05    PCI/M3
        XE-135           4.32E-02      NEUTRON ACTIVATION ANALYSIS                            1.00E+10    1.00E-05    PCI/M3

                 COMMENTS:          KR CONCENTRATION MAY BE ARTIFICIALLY HIGH.
```

```
TEST SERIES NO: 001C1    STREAM NO: 01    TEST ID NO: 001    SAMPLE NO: 01                                                   PAGE       14
                                                                                                                   FORM 11   DATE 04/02/80

BIOASSAY SUMMARY DATA-----------------------------

       TYPE OF ASSAY:  MUTAGENICITY                           NAME OF TESTING LAB: LOVE CANAL ANALYTICAL LAB

       TEST NAME: AMES                                       QA AUDIT CODE:  034    TEST START DATE: 12/31/78
                                                                                    FINISH DATE: 01/01/79

       ASSAY SAMPLE NO:  234    TEST DURATION:    1000 HRS.    ASSAY SAMPLE QUANTITY=      100 MG

       TEST ORGANISMS/STRAINS USED:
                                  SALMONELLA TYPHIMURIUM TA-98
                                  SALMONELLA TYPHIMURIUM TA-1535
                                  SALMONELLA TYPHIMURIUM TA-1537

       ASSAY RESULTS:

                      LD50 = 1.23E-01MG/M3        CONFIDENCE LIMITS- HIGH=  1.34E+05 -LOW=  1.45E-03

                  *** LEVEL OF TOXICITY=  HIGH            ***     MAXIMUM APPLICABLE DOSE=  1.56E-01 MG/M3

                      AMES TEST RESPONSE= POSITIVE                MINIMUM EFFECTIVE CONCENTRATION=  1.23E-02 MG/M3

                                                                 APPROXIMATE CONCENTRATION FACTOR= 1.25

       COMMENTS ON THE BIOASSAY:
                               REPLICATES WERE RUN ON ALL SAMPLES.
                               COMBINED SASS TRAIN CATCH WAS ANALYZED.
TOTAL CARDS = 00120
TOTAL FATAL ERRORS = 00011
TOTAL WARNING ERRORS = 00000
```

```
                     ADMINISTRATION SECTION
    0000


                        ,    00000


SERIES STATUS-------------
              DATA BASE:               GEDS
              TSN:                     00101
              SPONSOR:
              SPONSOR PROJECT OFFICER:
              CONTRACTOR CONTACT:
              CONTRACTOR PHONE:
              CONTRACT NUMBER:                      TASK/TD NO.
              NUMBER OF CARDS RECEIVED: 120
              DATA CARDS RECEIVED:     04/02/80
              TEST SERIES ASSIGNED:


    EDIT PHASE----------
              DATE STARTED:            04/02/80
              NUMBER OF RUNS:             1
              DATE ENCODED:
              DATE RECEIVED:
              DATE APPROVAL:
              DATE LAST RUN:
              NUMBER OF FATAL ERRORS:     11
              NUMBER OF WARNING ERRORS:


    LOAD PHASE---------
              DATE LOADED:
              CYCLE NO.:


    SERIES PHASE--------
              DATE LAST RUN:
              NUMBER OF RUNS:          00000
```

```
FPEIS*GLJ(1).INGEDS
     1      G  101       A0COMBUST-ENERGY      UTILITY             BOILER
     2      G  101       A1TANGENTIAL            200 MW    COAL      UNIT A
     3      G  101       A2KINGSTON STEAM PLANT                         KINGSTON           TN
     4      G  101       A327607USA    103  100       102         082777090177
     5      G  101       A4EPA                           68-02-2160123ACUREX
     6      G  101       A5FIELD TESTING OF A TANGENTIAL COAL-FIRED UTILITY BOILER--
     7      G  101       A6EFFECTS OF COMBUSTION MODIFICATION NOX CONTROL ON MULTIMEDIA EMIS
     8      G  101       A7HIGGEBOTHAM E B     ACUREX REPORT 79-337APRIL 1979
     9      G  101       B0 1LEVEL 1 TESTING FOR EFFECTS DUE TO NOX COMBUSTION MODIFICATIONS
    10      G  101       B0 2TEST #1 BASELINE
    11      G  101       B0 3TEST #2 BURNERS OUT OF SERVICE
    12      G  101       B0 4TEST #3 BIASED FIRING
    13      G  101 1     C0  1234M3/SEC 456 100 12 3401001BOILER FLUE GAS
    14      G  101 1     C1FLUE GAS INLET TO ID FAN
    15      G  101 1     C2SIGNIFICANT PITTING NOTED IN ID FAN BLADES.
    16      G  101 1     D001MECHANICAL COLLECTORCYCLONES
    17      G  101 1     D1DUSKOLECTOR         CONVENTIONALDUSKOLECTOR
    18      G  101 1     D2DUSKOLECTOR,INC.
    19      G  101 1     D301HIGH PRESSURE                 02LOW ENERGY
    20      G  101 1     D303STAINLESS STEEL
    21      G  101 1     D401PRESSURE DROP                 2.60E+00 KPA
    22      G  101 1     D402DESIGN EFFICIENCY             9.00E+01 % AT 100 M3/S
    23      G  101 1     D403DESIGN TEMPERATURE            150-250 C
    24      G  101 1     D404DESIGN FLOW RATE              1.00E+02 M3/S
    25      G  101 1     D405DESIGN POWER CONSUMPTION      1.50E+00 KWH
    26      G  101 1     D002ESP                 SINGLE STAGE ESP
    27      G  101 1     D1PLATE               CONVENTIONALR/C MODEL 16A
    28      G  101 1     D2RESEARCH-COTTRELL
    29      G  101 1     D301HOTSIDE                       02DRY
    30      G  101 1     D303HI VOLTAGE
    31      G  101 1     D401PLATE AREA                    2.00E+02 M2
    32      G  101 1     D402PLATE-PLATE SPACING           1.25E+00 CM
    33      G  101 1     D403DESIGN MASS EFFICIENCY        98 %
    34      G  101 1     D404BULK LINEAR VELOCITY          2.80E+01 M/S
    35      G  101 1     D405DESIGN PRESSURE DROP          5.49E-01 KPA
    36      G  101 1     D003LIQUID SCRUBBERS    ABSORPTION PROCESSES
    37      G  101 1     D1MAGNESIUM OXIDE      PILOT      MAG-OX SCRUBBER
    38      G  101 1     D2TAKAHASHI ALI, LTD
    39      G  101 1     D301MECHANICAL AIDED              02MOVING BED
    40      G  101 1     D401DESIGN PRESSURE DROP          5.88E-01 KPA
    41      G  101 1     D402INLET GAS VELOCITY            5.50E+01 M/S
    42      G  101 1     D403DESIGN LIQUID LOADING         6.50E+01 L/M3
    43      G  101 1     D404DESIGN EFFICIENCY             90 %
    44      G  101 1  1  E008307700120100CONTINUOUS STEADY STATE          890
    45      G  101 1  1  E101
    46      G  101 1  1  E201POWER CONSUMPTION             1.25E+00 KWH
    47      G  101 1  1  E202PRESSURE DROP                 8.50E-01 KPA
    48      G  101 1  1  E102
    49      G  101 1  1  E201PRESSURE DROP                 4.50E-01 KPA
    50      G  101 1  1  E202INLET GAS VELOCITY            1.25E+01 M/S
    51      G  101 1  1  F0COAL                          8.66 KG/SEC         15 KG
    52      G  101 1  1  F1COMMERCIAL TESTING AND ENGINEERING CO.  026  345M3
    53      G  101 1  1  F2MOISTURE           2.0 %WT ASH                   19.6 %WT
    54      G  101 1  1  F2VOLATILE MATTER   31.8 %WT FIXED CARBON          46.5 %WT
    55      G  101 1  1  F2SULFUR             2.2 %WT HEAT CONTENT      36288. J/G
    56      G  101 1  1  F3CARBON    63.1 HYDROGEN    4.3 SULFUR     2.2 NITROGEN    1.4
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57      G  101 1  1  F3ASH       19.6 CHLORINE       MOISTURE   2.0 OXYGEN      7.3
58      G  101 1  1  F4DENSITY     N   25 G/CM3                ZZ
59      G  101 1  1  F4PH          N   85                      WC1.40E+011.50E-01
60      G  101 1  1  F4COLOR        TBLACKISH GRAY             ZZ
61      G  101 1  1  F5M36        AA3.00E+035.00E-04MG         12.123>120E+02
62      G  101 1  1  F5M32        AA3.00E+035.00E-04MG         11.543 140E+00
63      G  101 1  1  F5M37        AA                                  100E+00
64      G  101 1  1  F5M68        AA                                  260E+01
65      G  101 1  1  F5M74        AA                                  860E+00
66      G  101 1  1  F5M72        AA                                  640E+03
67      G  101 1  1  F5M46        AA                                  140E+01
68      G  101 1  1  F5M71        AA                                  170E+01
69      G  101 1  1  F5M76        AA                                  600E-01
70      G  101 1  1  F7SAMPLE TAKEN 5 METERS ABOVE GROUND LEVEL.
71      G  101 1  1  F8BELOW 5-METER LEVEL WAS FROM DIFFERENT SOURCE.
72      G  101 1  1 1H0 SASS TRAIN WITH/CYCLONES      1234001 123  45 46 66      12
73      G  101 1  1 1H1    12L/S   PITOT TUBE          10000MG
74      G  101 1  1 1H203.5 M FROM SCRUBBER OUTLET      80  5   52
75      G  101 1  1 1H5NONE
76      G  101 1  1 1H6THE IMPINGERS WERE COMBINED.
77      G  101 1  1 1K001EAD-2 CARTDG    1.23E+01WOLFPACK TESTING SERVICE
78      G  101 1  1 1K101024019FONDA NUCLEAR LABS                             123 MG
79      G  101 1  1 1K2 1PH            T 5.6-6.3      WC
80      G  101 1  1 1K301NO WIND SPEED MEASUREMENTS WERE MADE.
81      G  101 1  1 1M001LC1    1.2    1.3M01         GS1.00E+051.00E-06MG      10 100E-06
82      G  101 1  1 1M001LC2    1.2    1.4M08         GS1.00E+051.00E-04MG      10<122E-04
83      G  101 1  1 1M001LC3    1.7    1.3M12         GS1.00E+051.00E-06MG     100 102E-01
84      G  101 1  1 1M001LC4    1.2    1.4M16         GS1.00E+051.00E-04MG      10<122E-04
85      G  101 1  1 1M001LC5    1.2    1.5M11         GS1.00E+051.00E-04MG      10 147E-02
86      G  101 1  1 1M001LC6    1.2    1.7M14         GS1.00E+051.00E-06MG     100 129E-01
87      G  101 1  1 1M001LC7    1.2    1.7M18         GS1.00E+051.00E-04MG     100 136E-04
88      G  101 1  1 1M101REPLICATE SETS RUN ON ALL FRACTIONS.
89      G  101 1  1 1R001KR-85    NA1.00E+101.00E-05PCI/M3  <133E-05
90      G  101 1  1 1R001XE-133M NA1.00E+101.00E-05PCI/M3   432E-02
91      G  101 1  1 1R001XE-133  NA1.00E+101.00E-05PCI/M3  <500E-05
92      G  101 1  1 1R001XE-135  AA1.00E+101.00E-05PCI/M3   432E-02
93      G  101 1  1 1R101KR CONCENTRATION MAY BE ARTIFICIALLY HIGH.
94      G  101 1  1 1K002IMPINGERS        1.13E+02WOLFPACK TESTING SERVICE
95      G  101 1  1 1K102024019FONDA NUCLEAR LABS                             123 MG
96      G  101 1  1 1K2 2PH            T 5.6-6.3      WC
97      G  101 1  1 1K302NO WIND SPEED MEASUREMENTS WERE MADE.
98      G  101 1  1 1M002LC1    1.2    1.3M01         GS1.00E+051.00E-06MG      10 100E-06
99      G  101 1  1 1M002LC2    1.2    1.4M08         GS1.00E+051.00E-04MG      10<122E-04
100     G  101 1  1 1M002LC3    1.7    1.3M12         GS1.00E+051.00E-06MG     100 102E-01
101     G  101 1  1 1M002LC4    1.2    1.4M16         GS1.00E+051.00E-04MG      10<122E-04
102     G  101 1  1 1M002LC5    1.2    1.5M11         GS1.00E+051.00E-04MG      10 147E-02
103     G  101 1  1 1M002LC6    1.2    1.7M14         GS1.00E+051.00E-06MG     100 129E-01
104     G  101 1  1 1M002LC7    1.2    1.7M18         GS1.00E+051.00E-04MG     100 136E-04
105     G  101 1  1 1M102REPLICATE SETS RUN ON ALL FRACTIONS.
106     G  101 1  1 1R002KR-85    NA1.00E+101.00E-05PCI/M3  <133E-05
107     G  101 1  1 1R002XE-133M NA1.00E+101.00E-05PCI/M3   432E-02
108     G  101 1  1 1R002XE-133  NA1.00E+101.00E-05PCI/M3  <500E-05
109     G  101 1  1 1R002XE-135  NA1.00E+101.00E-05PCI/M3   432E-02
110     G  101 1  1 1R102KR CONCENTRATION MAY BE ARTIFICIALLY HIGH.
111     G  101 1  1 1T0MUTAGENICITY            AMES                          0010000234
112     G  101 1  1 1T1LOVE CANAL ANALYTICAL LAB              034123178010179
113     G  101 1  1 1T2      100MG
```

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    114      G  101 1  1 1T3SALMONELLA TYPHIMURIUM TA-98
    115      G  101 1  1 1T3SALMONELLA TYPHIMURIUM TA-1535
    116      G  101 1  1 1T3SALMONELLA TYPHIMURIUM TA-1537
    117      G  101 1  1 1T4LD50123E-01MG/M3   134E+05145E-03 156E-01MG/M3    HIGH
    118      G  101 1  1 1T5POSITIVE      123E-02MG/M3  1.25
    119      G  101 1  1 1T901REPLICATES WERE RUN ON ALL SAMPLES.
    120      G  101 1  1 1T902COMBINED SASS TRAIN CATCH WAS ANALYZED.
**

@FREE FNY.
READY

@BRKPT PRINT$
```

```
  1    G  101      A0COMBUST-ENERGY      UTILITY            BOILER
       NO. TYPE  COMPONENT MESSAGE
       154 F               TEST SERIES NUMBER NOT IN STATUS FILE                          4

 19    G  101 1     D301HIGH PRESSURE                  02LOW ENERGY
       NO. TYPE  COMPONENT MESSAGE
       126 F               INVALID DEVICE/PROCESS KEYWORD TABLE MATCH                     4
       126 F               INVALID DEVICE/PROCESS KEYWORD TABLE MATCH                     4

 20    G  101 1     D303STAINLESS STEEL
       NO. TYPE  COMPONENT MESSAGE
       126 F               INVALID DEVICE/PROCESS KEYWORD TABLE MATCH                     4

 27    G  101 1     D1PLATE              CONVENTIONALR/C MODEL 16A
       NO. TYPE  COMPONENT MESSAGE
       124 F               INVALID CONTROL SYSTEM TABLE MATCH                             4

 29    G  101 1     D301HOTSIDE                        02DRY
       NO. TYPE  COMPONENT MESSAGE
       126 F               INVALID DEVICE/PROCESS KEYWORD TABLE MATCH                     4
       126 F               INVALID DEVICE/PROCESS KEYWORD TABLE MATCH                     4

 30    G  101 1     D303HI VOLTAGE
       NO. TYPE  COMPONENT MESSAGE
       126 F               INVALID DEVICE/PROCESS KEYWORD TABLE MATCH                     4

 37    G  101 1     D1MAGNESIUM OXIDE     PILOT       MAG-OX SCRUBBER
       NO. TYPE  COMPONENT MESSAGE
       125 F               INVALID DEVICE/PROCESS CLASS TABLE MATCH                       4

 39    G  101 1     D301MECHANICAL AIDED               02MOVING BED
       NO. TYPE  COMPONENT MESSAGE
       126 F               INVALID DEVICE/PROCESS KEYWORD TABLE MATCH                     4
       126 F               INVALID DEVICE/PROCESS KEYWORD TABLE MATCH                     4

120    G  101 1  1 1T902COMBINED SASS TRAIN CATCH WAS ANALYZED.
       NO. TYPE  COMPONENT MESSAGE
       155 F               STATUS FILE MODIFY DID NOT WORK                                2
       156 F     C1845     NON-NUMERIC TOTAL MG RECOVERED                                 4
```

SECTION 6

DATA RETRIEVAL

6.0 INTRODUCTION

The purpose of this section is to provide users with instructions for submitting new data for entry to the EADS and for retrieving existing data from the EADS. In particular, Section 6 discusses direct interactions with the computer and procedures for those users who do not have direct access to the EPA National Computer Center (NCC) at Research Triangle Park, North Carolina.

It is likely that many users of the EADS will have neither the time nor the inclination to pursue the direct access methods. Since Federal regulations do not permit the sale of computer services by government data centers like the NCC, most users will not be authorized to access the NCC unless they are under EPA contract. For this reason, procedures have been established which will enable those "off-line" users to retrieve information by written or telephone request instead.

It should be noted that there is no charge for "off-line" data retrieval; however, EPA makes no guarantee regarding the completeness of the data or the promptness of the response. In all likelihood, simple data requests will be processed quickly, but the staff response will depend upon their current workload and on the complexity of the request. Special data requests which require computer program development will take longer. Requesters will be appraised of any expected delays.

6.1 DATA RETRIEVAL USING THE PROGRAM LIBRARY

The simplest method of retrieving data for an off-line user is to request a program from the Program Library. Section 7 presents the programs available which may be utilized to retrieve EADS data in a specified manner. Each program is described separately and has its own requirements for data input or qualification by the user.

Programs may be requested by off-line users by telephone or in writing. The requester should supply all information in accordance with the requirements of the program and send the completed request to the following address:

EADS Program Manager
Special Studies Staff (MD-63)
Industrial Environmental Research Laboratory
U.S. Environmental Protection Agency
Research Triangle Park, North Carolina 27711

Users should send separate requests for different runs even if the same program is being used repeatedly. For example, if a user wishes to interrogate the data base according to a specific access criteria, any change to that criteria must be shown in a separate request. Receipt of the request will be acknowledged to the requester in writing. If there are any errors in the request or some information is missing, the requester will be contacted to clarify the problem. When the request has been processed, the output will be sent to the requester for verification.

6.2 SPECIAL DATA RETRIEVAL REQUESTS

It is recognized at the outset that the Program Library is not likely to be diverse enough to satisfy all user needs for data. For this reason, a special data retrieval request category was established. There is no specific form to be used for special requests; there is merely a set of general guidelines to follow in preparing the request. These guidelines are as follows:

1. Be explicit. Be thoroughly familiar with the GEDS data base structure. Identify each data base element to be sorted and/or retrieved by name. Should additional work on the request be required, consultation with the requester will be initiated, and, upon completion, the printout will be sent to the requester for verification.
2. Plan the request: Be sure that the access criteria applies to the proper type of data element. Remember that only key values may be retrieved directly and that non-key values must be qualified for data access (see Section 6.3). Specify all needed qualifications and identify all input data for comparative evaluation.
3. Define the output: Determine how you wish the data to be displayed on output. Identify how data elements are to be ordered. Specify column headings. Define any calculations to be performed on the accessed data.

The completed definition of the request should be sent to the EADS Program Manager at IERL-RTP. The user should be sure to include his own telephone number with the request. If there are any problems encountered with the request, the user will be contacted by telephone to resolve the problem.

When the request has been received, a letter of acknowledgement will be sent to the requester. The letter will include a preliminary estimate of the length of time required to process the request. As emphasized previously, the length of time needed to process a special request will depend upon the complexity of the request.

If no problems are encountered that require consultation with the requester, the results will be sent to the requester when the processing is completed. The requester should review the output to verify that it satisfies the request. If it does not, the printout should be returned with corrections to IERL for reworking. If the printout is satisfactory, the requester should notify the EADS Program Manager of his acceptance.

6.3 KEY/NON-KEY DATA ELEMENTS

Data elements in a SYSTEM 2000® data base may be either KEY or NON-KEY. This designation determines whether a particular data element may be accessed directly or must be qualified by including additional information. KEY elements may be selected directly; NON-KEY elements require qualification by a KEY element. For example, the data element GENERIC DEVICE/PROCESS TYPE is KEY and may be used to directly access the data of interest, such as in the following:

```
PRINT GEDS TEST SERIES NUMBER WHERE GENERIC DEVICE/PROCESS TYPE EQ
ESP:
```

If, however, the data element is NON-KEY, as in the case of SERIES START DATE, then qualification will be required:

```
IF SERIES START DATE GT 1/1/80 THEN PRINT GEDS TEST SERIES NUMBER
WHERE NAME OF SAMPLING GROUP EQ XYZ LABORATORY:
```

In this case, the KEY element, NAME OF SAMPLING GROUP, is used to qualify the request regarding a NON-KEY data element.

Table 6-1 lists the KEY data elements, along with their SYSTEM 2000® component numbers.

TABLE 6-1. LIST OF KEY DATA ELEMENTS

101*	FPEIS TEST SERIES NUMBER
102*	GEDS TEST SERIES NUMBER
103*	LEDS TEST SERIES NUMBER
104*	SDDS TEST SERIES NUMBER
105*	TEST SERIES KEY
106*	DB KEY
110*	SOURCE CATEGORY
120*	SOURCE TYPE
125*	PRODUCT/DEVICE
130*	PROCESS TYPE
140*	DESIGN PROCESS RATE
145*	DESIGN PROCESS RATE UNITS
150*	FEED MATERIAL CATEGORY
155*	SPONSOR ORGANIZATION
160*	SPONSOR ORGANIZATION CONTRACT NUMBER
170*	T.D./TD NUMBER
180*	SOURCE NAME
190*	SITE NAME
210*	CITY
220*	STATE
230*	ZIP CODE
232*	COUNTRY
235*	FPEIS TSN CROSS REFERENCE
240*	SDDS TSN CROSS REFERENCE
250*	GEDS TSN CROSS REFERENCE
260*	LEDS TSN CROSS REFERENCE
270*	SIC CODE
300*	NPDES NUMBER
330*	NAME OF SAMPLING GROUP
355*	DATE OF ENTRY
370*	SITE LATITUDE
372*	SITE LONGITUDE
374*	FRACTION DESIGN RATE IND ORIGIN
378*	CONTRIBUTING INDUSTRIAL CATEGORY NUMBER
380*	INDUSTRY-COMMERICAL SIC NUMBER
382*	CATEGORY FLOW CONTRIBUTION
384*	NUMBER OF ESTABLISHMENTS
410*	STREAM NUMBER
420*	STREAM NAME
475*	STACK HEIGHT
505*	DEVICE/PROCESS NO
510*	GENERIC DEVICE/PROCESS TYPE
515*	DESIGN TYPE
520*	SPECIFIC PROCESS/DEVICE TYPE
530*	DEVICE/PROCESS CLASS
540*	DEVICE/PROCESS COMMERCIAL NAME
550*	MANUFACTURER
585*	DEVICE/PROCESS CATEGORY SEQ NUMBER
590*	DEVICE/PROCESS CATEGORY KEYWORD
610*	DES-PARAMETER NUMBER
810*	TEST-ID-NUMBER
869*	FF-SEQUENCE NUMBER
870*	FF-SOURCE FEED MATERIAL
877*	FF-LABORATORY NAME
878*	FF-QA-QC CODE
885*	FF-PA-PARAMETER
905*	FF-UA-PARAMETER
923*	FF-PARAMETER
926*	FF-ANALYSIS METHOD
945*	FF-C-CATEGORY/SPECIES
946*	FF-C-CS-TYPE
947*	FF-C-CS-PRIORITY
950*	FF-C-ANALYSIS METHOD
1010*	OP-DEVICE NUMBER
1060*	OPERATING PARAMETER NUMBER
1203*	SMPL-NUMBER
1206*	MEASUREMENT INST/METHOD TYPE
1209*	MEASUREMENT INST/METHOD NAME
1221*	SMPL-FLOWRATE MEASUREMENT METHOD
1245*	SAMPLING LOCATION CODE
1247*	SAMPLING LOCATION DEVICE NUMBER
1276*	PARTICLE DIAMETER BASIS
1278*	PARTICLE CONCENTRATION BASIS
1303*	COMPONENT SEQUENCE NO
1305*	SAMPLING EQUIPMENT COMPONENT NAME
1310*	STAGE/FILTER CUT SIZE
1320*	CHEMICAL ANALYSIS LAB NAME
1321*	CHEMICAL QA-QC CODE
1324*	RADIONUCLIDE ANALYSIS LAB NAME
1325*	RAD-QA-QC CODE
1420*	EC-PARAMETER
1425*	EC-ANALYSIS METHOD
1830*	IA-SPECIES-ID-TYPE
1835*	IA-SPECIES-ID
1840*	IA-ANALYSIS-METHOD
1836*	IA-SPECIES-PRIORITY
2530*	LIOA-FRACTION-ID
2580*	LIOAFED-CATEGORY/SPECIES TYPE
2582*	LIOAFED-CATEGORY/SPECIES
2583*	LIOAFED-CATEGORY/SPECIES-PRIORITY
2585*	LIOAFED-ANALYSIS METHOD
3025*	RN-RADIONUCLIDE ID
3030*	RN-ANALYSIS METHOD
3205*	BIO-TEST TYPE
3210*	BIO-TEST NAME
3225*	BIO-TEST LAB NAME
3226*	BIO-TEST QA-QC
3280*	BIO-VALUE TYPE
3315*	BIO-LEVEL OF TOXICITY
3320*	BIO-BACT. MUTAGEN RESPONSE
3255*	BIO-ORGANISMS/STRAINS

6.4 ON-LINE REQUEST PROCEDURES

The phrase "on-line request" implies that the user intends to establish direct communication with the EADS data base through some type of terminal-to-computer link. The procedure described in this section may be used by a qualified user of EPA's NCC to access the EADS directly through an interactive data communications (demand) terminal or a remote job entry terminal. The specific qualifications for NCC user access are discussed in Section 6.5.

On-line users of the EADS are presumed to have a reasonably working knowledge of UNIVAC 1100 series computers and, in some cases, of SYSTEM 2000® natural language. Special data retrieval procedures (see Section 7) have been developed to minimize the data processing knowledge required to use the EADS. Any user unsure of his familiarity with the UNIVAC or SYSTEM 2000® is urged to request information through the off-line procedures described previously in this section.

On-line users are granted READ-ONLY access to the EADS data base. No updating of data is permitted. New data must be submitted through the EPA project officer. In the READ-ONLY mode, the user may retrieve, for sorting and evaluation, any data stored in the system. The user may take advantage of the wide array of features offered by SYSTEM 2000® for data sorting and retrieval.

6.5 NCC USER QUALIFICATIONS AND SERVICES REGISTRATION

Qualified users are defined as those who have valid accounts with the NCC at Research Triangle Park, North Carolina. In most cases, NCC users are either EPA personnel or contractors who are under EPA contract. The NCC is not available to public subscribers. Federal regulations prohibit the marketing of computer time by government data centers which may be in competition with commercial computer services vendors. Thus, it is not usually possible for EADS users who are not under EPA contract to obtain account numbers in order to access the NCC directly. Exceptions to this may be found with user access through interagency agreements or grants. The qualifications of a potential NCC user are determined by EPA's Management Information and Data Systems Division (MIDSD).

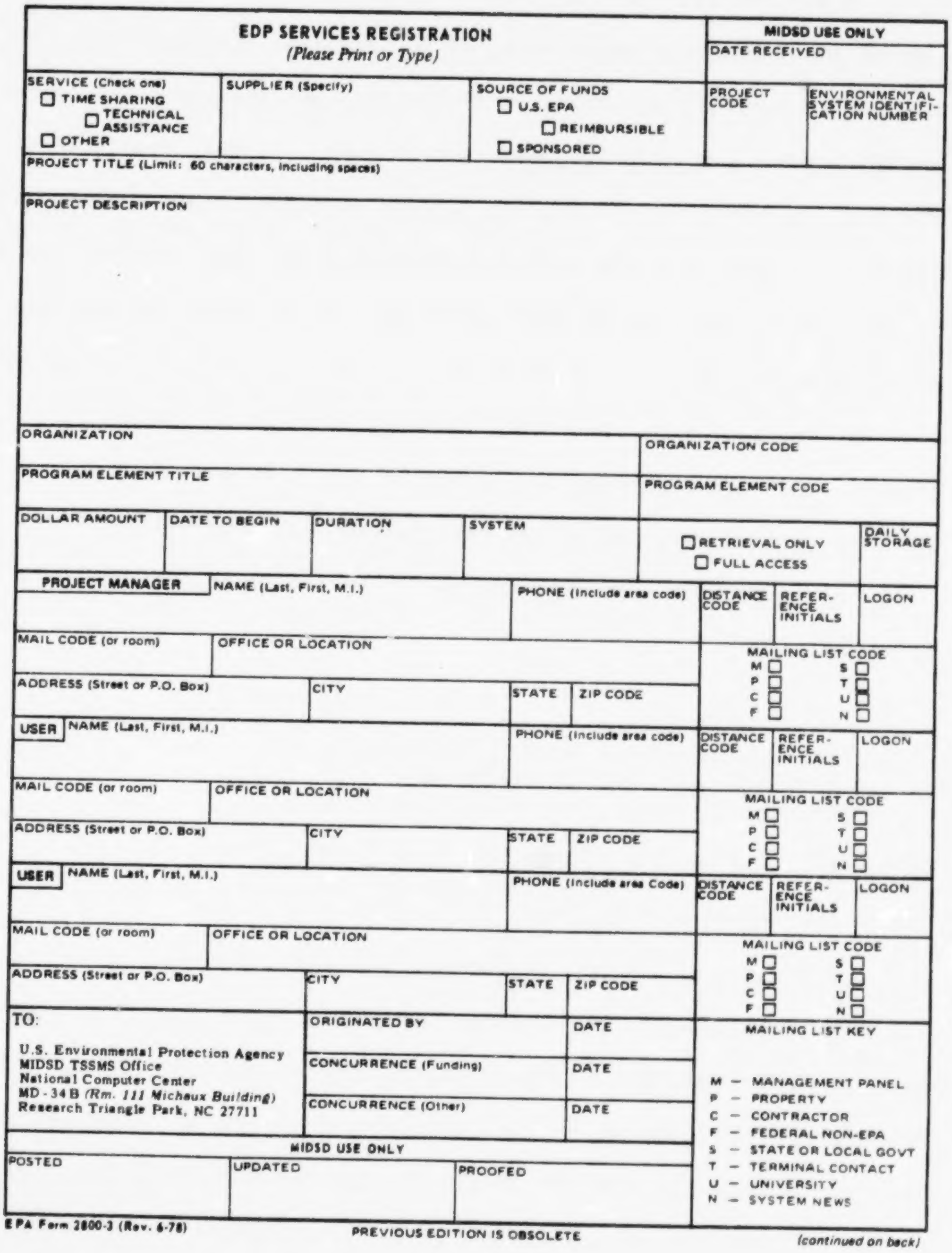
Any questions regarding the qualification of a user should be addressed to:

MIDSD TSSMS Office
U.S. Environmental Protection Agency
National Computer Center (MD-34B)
Research Triangle Park, North Carolina 27711

or by telephone to 919/541-3629 (FTS: 629-3629).

6.5.1 Registration Procedures

All users of the NCC UNIVAC 1100 must be registered for accounting and security purposes. Application for NCC services is made by submitting a completed EPA Form 2800-3 (Figure 6-1) to the appropriate Automated Data Processing (ADP) coordinator for approval and signature. Each EPA office or laboratory which uses the NCC or other computing facilities has a designated person (or persons) who serves as the ADP coordinator. All procedural matters pertaining to the use of the NCC should be directed to the ADP coordinator. The MIDSD Time Sharing Services Management System (TSSMS)



EDP SERVICES REGISTRATION
(Please Print or Type)

MIDSD USE ONLY
DATE RECEIVED

SERVICE (Check one)
☐ TIME SHARING
☐ TECHNICAL ASSISTANCE
☐ OTHER

SUPPLIER (Specify)

SOURCE OF FUNDS
☐ U.S. EPA
☐ REIMBURSIBLE
☐ SPONSORED

PROJECT CODE

ENVIRONMENTAL SYSTEM IDENTIFICATION NUMBER

PROJECT TITLE (Limit: 60 characters, including spaces)

PROJECT DESCRIPTION

ORGANIZATION

ORGANIZATION CODE

PROGRAM ELEMENT TITLE

PROGRAM ELEMENT CODE

DOLLAR AMOUNT | DATE TO BEGIN | DURATION | SYSTEM

☐ RETRIEVAL ONLY
☐ FULL ACCESS

DAILY STORAGE

PROJECT MANAGER NAME (Last, First, M.I.) | PHONE (Include area code) | DISTANCE CODE | REFERENCE INITIALS | LOGON

MAIL CODE (or room) | OFFICE OR LOCATION

ADDRESS (Street or P.O. Box) | CITY | STATE | ZIP CODE

MAILING LIST CODE
M ☐ S ☐
P ☐ T ☐
C ☐ U ☐
F ☐ N ☐

USER NAME (Last, First, M.I.) | PHONE (Include area code) | DISTANCE CODE | REFERENCE INITIALS | LOGON

MAIL CODE (or room) | OFFICE OR LOCATION

ADDRESS (Street or P.O. Box) | CITY | STATE | ZIP CODE

MAILING LIST CODE
M ☐ S ☐
P ☐ T ☐
C ☐ U ☐
F ☐ N ☐

USER NAME (Last, First, M.I.) | PHONE (Include area Code) | DISTANCE CODE | REFERENCE INITIALS | LOGON

MAIL CODE (or room) | OFFICE OR LOCATION

ADDRESS (Street or P.O. Box) | CITY | STATE | ZIP CODE

MAILING LIST CODE
M ☐ S ☐
P ☐ T ☐
C ☐ U ☐
F ☐ N ☐

TO:

U.S. Environmental Protection Agency
MIDSD TSSMS Office
National Computer Center
MD - 34 B *(Rm. 111 Michaux Building)*
Research Triangle Park, NC 27711

ORIGINATED BY | DATE
CONCURRENCE (Funding) | DATE
CONCURRENCE (Other) | DATE

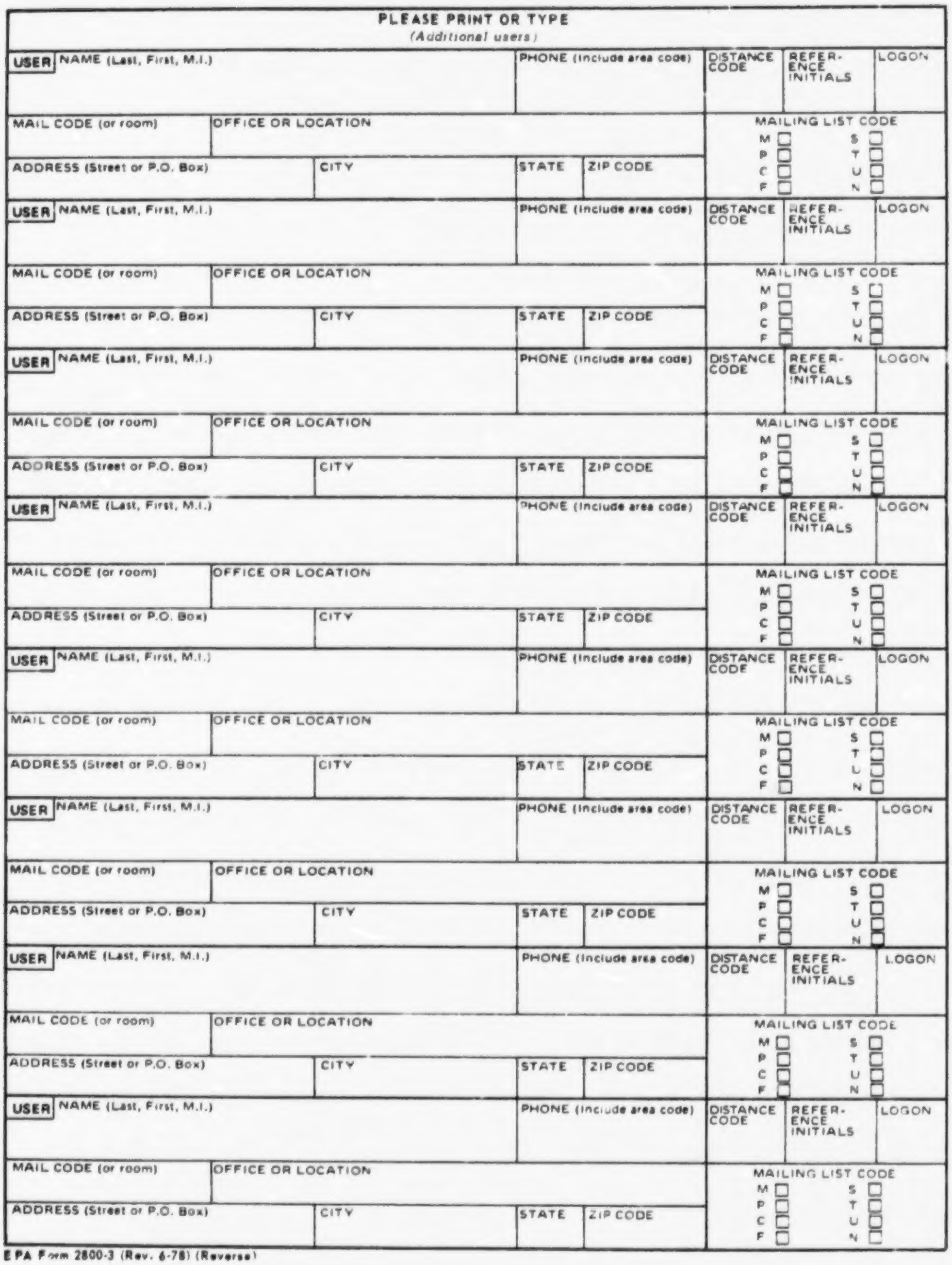
MAILING LIST KEY

M — MANAGEMENT PANEL
P — PROPERTY
C — CONTRACTOR
F — FEDERAL NON-EPA
S — STATE OR LOCAL GOVT
T — TERMINAL CONTACT
U — UNIVERSITY
N — SYSTEM NEWS

MIDSD USE ONLY
POSTED | UPDATED | PROOFED

EPA Form 2800-3 (Rev. 6-78)
PREVIOUS EDITION IS OBSOLETE
(continued on back)

Figure 6-1. NCC application.



PLEASE PRINT OR TYPE
(Additional users)

USER NAME (Last, First, M.I.)		PHONE (include area code)		DISTANCE CODE	REFERENCE INITIALS	LOGON
MAIL CODE (or room)	OFFICE OR LOCATION			MAILING LIST CODE M ☐ S ☐ P ☐ T ☐ C ☐ U ☐ F ☐ N ☐		
ADDRESS (Street or P.O. Box)	CITY	STATE	ZIP CODE			
USER NAME (Last, First, M.I.)		PHONE (include area code)		DISTANCE CODE	REFERENCE INITIALS	LOGON
MAIL CODE (or room)	OFFICE OR LOCATION			MAILING LIST CODE M ☐ S ☐ P ☐ T ☐ C ☐ U ☐ F ☐ N ☐		
ADDRESS (Street or P.O. Box)	CITY	STATE	ZIP CODE			
USER NAME (Last, First, M.I.)		PHONE (include area code)		DISTANCE CODE	REFERENCE INITIALS	LOGON
MAIL CODE (or room)	OFFICE OR LOCATION			MAILING LIST CODE M ☐ S ☐ P ☐ T ☐ C ☐ U ☐ F ☐ N ☐		
ADDRESS (Street or P.O. Box)	CITY	STATE	ZIP CODE			
USER NAME (Last, First, M.I.)		PHONE (include area code)		DISTANCE CODE	REFERENCE INITIALS	LOGON
MAIL CODE (or room)	OFFICE OR LOCATION			MAILING LIST CODE M ☐ S ☐ P ☐ T ☐ C ☐ U ☐ F ☐ N ☐		
ADDRESS (Street or P.O. Box)	CITY	STATE	ZIP CODE			
USER NAME (Last, First, M.I.)		PHONE (include area code)		DISTANCE CODE	REFERENCE INITIALS	LOGON
MAIL CODE (or room)	OFFICE OR LOCATION			MAILING LIST CODE M ☐ S ☐ P ☐ T ☐ C ☐ U ☐ F ☐ N ☐		
ADDRESS (Street or P.O. Box)	CITY	STATE	ZIP CODE			
USER NAME (Last, First, M.I.)		PHONE (include area code)		DISTANCE CODE	REFERENCE INITIALS	LOGON
MAIL CODE (or room)	OFFICE OR LOCATION			MAILING LIST CODE M ☐ S ☐ P ☐ T ☐ C ☐ U ☐ F ☐ N ☐		
ADDRESS (Street or P.O. Box)	CITY	STATE	ZIP CODE			
USER NAME (Last, First, M.I.)		PHONE (include area code)		DISTANCE CODE	REFERENCE INITIALS	LOGON
MAIL CODE (or room)	OFFICE OR LOCATION			MAILING LIST CODE M ☐ S ☐ P ☐ T ☐ C ☐ U ☐ F ☐ N ☐		
ADDRESS (Street or P.O. Box)	CITY	STATE	ZIP CODE			

EPA Form 2800-3 (Rev. 6-78) (Reverse)

Figure 6-1. Concluded.

Office is located at the National Computer Center. Requests for EPA user account modifications processed through the ADP coordinators to authorize new accounts or add new users to existing accounts, normally submitted using the EPA Form 2800-3, should then be forwarded to the following address:

MIDSD TSSMS Office
U.S. Environmental Protection Agency
National Computer Center (MD-34B)
Research Triangle Park, North Carolina 27711

In instances where a user organization requires immediate access to computer facilities, temporary authorization can be achieved by telephone contact with the TSSMS Office. Requests for temporary authorization should be directed to 919/541-3629 (FTS: 629-3629). Upon receiving temporary authorization, a completed Form 2800-3 must be forwarded to the TSSMS Office. The temporary authorization obtained by telephone is valid for a 2-week period pending receipt of the Form 2800-3 for processing permanent authorization. Users must specify an EPA employee as Project Manager who, in all cases, becomes responsible for the utilization of the account. Requests for cancellation of specific users authorized under a given account or changes in user address/telephone numbers will be processed by telephone using the TSSMS telephone number listed above.

Non-EPA users (e.g., contractors, grantees, etc.) should submit all required forms to their EPA project officer, who in turn will forward the information to the ADP coordinator. Account authorizations/modifications for Interagency Agreement User Accounts (non-EPA users) should be forwarded for approval to:

W. G. Allen, Computer Specialist
U.S. Environmental Protection Agency
National Computer Center (MD-34)
Research Triangle Park, North Carolina 27711

Upon approval of Interagency requests, the TSSMS Office will complete implementation of the authorization and notify the respective project manager. Any questions concerning the above should be directed to the TSSMS Office at 919/541-3641 (FTS: 629-3641). Please note that, in regard to EPA Form 2800-3, the organization titles and codes and the EPA DIPS organization titles and codes, and the program element titles and codes are assigned by the Office of Planning and Programming. The account number will be assigned to the user by MIDSD and must appear on all transactions attempted with the NCC UNIVAC 1100.

6.5.2 User ID and Password

The NCC UNIVAC 1100 has a comprehensive, multi-level security system which is designed to prohibit unauthorized use of the computer. A feature of this security system is the TSSMS which requires that all users be identified by a unique USERID and PASSWORD before access to the computer is granted. The USERID/PASSWORD must appear on all demand and batch job requests. This will be discussed in detail later in Sections 6.6 and 6.7, respectively.

The USERID/PASSWORD is assigned to each individual user of the NCC by MIDSD. Requests for a USERID/PASSWORD should be submitted to the appropriate ADP coordinator (through the EPA project officer, if necessary) for approval and signature.

6.6 INTERACTIVE TERMINAL OPERATION

Demand processing or interactive terminal operation, is defined as a mode of operation in which processing is dependent on manual interface with the central processor during processing. Basically, it is a conversational mode of operation requiring a demand and response type of activity. Conversational operation via a remote terminal causes the Executive System, a demand processor, or an active program to immediately react and respond. Demand processing terminals are generally thought of as being remote from the computer site and as having a printer or a cathode-ray tube and keyboard. An example of a demand terminal is the teletype-writer keyboard and printer.

The distinction between batch-mode processing and demand processing lies in the frequent interaction with the user that occurs during demand processing. The terminal user is considered to be in conversation with the Executive System, special demand function, user programs, or the batch functions of the Executive System on a unit basis.

Tasks executed by the demand terminal user normally have frequent but short bursts of computation. To process a substantial amount of computation may require a long period of time. Access to computation is a percentage of the total computing facility and is scheduled in small increments of time at frequent intervals to provide immediate responses. This action gives the appearance of total system control to the user and the impression of being the only user currently running. The more a user is required to interact with a demand program the shorter the bursts of computation required to service a given request. The bursts of computation are time-shared within the Executive System to provide an apparent immediate response, with the program placed in a dormant mode during idle periods awaiting response from the user.

While a demand program is in a dormant mode, it may be necessary to swap the program from main storage. Normally, this transfer happens only when main storage is full and another program currently on mass storage has work to do.

The demand has three distinct modes of operation. They are described below:

- Terminal Inactive Mode -- The initial mode of the terminal following the sign-on procedure. The terminal will return to this mode at the completion of the other two modes.
- Demand Run Mode -- This mode is achieved by submitting a @RUN control statement (see Section 6.6.1) from the primary input device; that is, the keyboard. The terminal operator must wait until the date and time message is displayed at the terminal before submitting the run stream data. In demand mode, the input will be solicited when input is desired by the Executive System. The terminal is returned to the inactive mode by submitting a @FIN control statement (see Section 6.6.2).
- Batch Mode -- The demand terminal may be switched from demand mode to batch mode for input or output. The "B" sub-option on the @RUN control statement (@RUN,/B) will place the terminal in batch input mode. Input will not be solicited as in demand run mode. The terminal will be returned to the terminal inactive mode following a @FIN control statement. Another @RUN control statement will be accepted while in the remote batch run whether it contains a 'B' option or not. Output files generated by the batch run, as well as those SYM'd (via @SYM) to the terminal can be displayed at the terminal by entering

the statement, @@SEND. The terminal is returned to the inactive mode when the output process of the file is complete.

Interactive (or demand) processing with the NCC UNIVAC 1100 is supported for a variety of low-speed data communications terminals. Generally speaking, most 30 character/second (CPS) terminals which have ASCII character sets will be able to access the NCC. The NCC does not support any terminals which operate at 10 CPS or 15.5 CPS. Also, the NCC does not support IBM 2741 or similar EBCIDIC code set terminals.

A partial list of terminals supported by the NCC for demand processing include the following:

Anderson-Jacobson Models 630, 840, 830, and 832

UNIVAC UNISCOPE 100

UNIVAC DCT 500 or equivalent

Texas Instruments Silent 700 series

Hazeltine (most models)

LA36 DECwriter II

If you are uncertain about the compatability of a particular terminal with the NCC UNIVAC 1100, you should contact the following:

NCC User Services
919/541-3649
FTS: 629-3649

All UNIVAC supported demand terminals use a common interface (device routines providing the user interface with unit record peripherals) for input and output processing. This provides several controls and features to all demand terminals in a uniform manner. Control of remote symbionts is regulated by control statements prefixed with a double master space (@@). These control statements do not require the input solicitation.

They may be entered after an output interrupt (break-key) or any other time the terminal operator finds the need. The control statements are given in Table 6-2.

For more details on demand processing, the user should refer to the National Computer Center User Reference Manual. This manual may be obtained from NCC User Services at the telephone numbers listed above. The remainder of this section will address demand processing as it applies to the EADS.

6.6.1 Initiating a Demand Processing Session

Communications are established with the NCC UNIVAC 1100 through data communication modems or couplers over voice-grade telephone lines. Users should follow the steps given in the equipment user manual for their terminal in order to establish the data link to the computer. A list of nationwide telephone access numbers for the NCC is given in Table 6-3. Once the data link is established, the following sequence of commands should be entered (for clarity, the information printed by the computer is shown in capital letters; the input required from the user in small letters).

Note that the pound sign (#) denotes a carriage return:

Command	Description
#nccdemd#	This identifies the NCC to the communications network.
READY TO NCC ON 9E	Response indicates that communication is established on Port 9E.
ENTER USERID/PASSWORD >xxx/xxxxxx#	Enter the approved USERID and PASSWORD following the input solicitation symbols (>).
*DESTROY USERID/PASSWORD ENTRY	

(continued on page 6.6-8)

TABLE 6-2. REMOTE INTERFACE CONTROL STATEMENTS

Statement	Mode	Description
@@X TIOC		The @@X statement directs the Executive System to take action on any or all of the four possible action parameters. The @@X defaults to @@X 0.
	Demand Run	T -- terminate the demand run's present execution.
	Demand Run	I -- discard all backed-up input.
	Demand Run	0 -- discard all backed-up output.
	Demand Run	C -- generate a 'BRK' contingency.
@@SKIP n	Demand Run	Ship n lines of output where n is a value of 0 to 63. The SKIP may be reset by a @@SKIP 0. The @@SKIP n defaults to @@SKIP 0.
@@SEND	Terminal Inactive	Send a queued batch output file to the terminal.
@@RQUE	Remote Batch	Stop the present batch output file and requeue it for a later @@SEND request. Return to terminal inactive mode.
@@CONT	All	Directs the symbiont to continue. Useful after a BRK-KEY when no action is desired.
@@CQUE	Demand Run	Circumvent input solicitation requirement. Allow several input images to be buffered in memory before the terminal is placed in the wait condition.
@@INQ	All	Directs the Executive System to buffer all input to mass storage until the @@END control statement is received. If the @@INQ statement is entered in terminal inactive mode, the next input should be a @RUN statement. All @RUN statements entered while in @@INQ mode will be considered remote batch and not demand.

TABLE 6-2. Concluded

Statement	Mode	Description
@@END	All	Terminates special input mode, i.e., @@CQUE or @@INQ. The @@END returns the terminal to demand run from @@CQUE and will process the mass storage buffered input of @@INQ.
@@ESC	Demand Run	Allows the input to be passed to the requester unaltered from the format of which it was entered; that is, all communication envelope characters are not removed nor is the image translated.
@@TERM	All	Directs the Executive System to terminate the terminal. It is recommended that the remote Operator enter @@TERM only while in the terminal inactive mode. However, if entered while a run is active, the run and terminal will be terminated. @@TERM is equivalent to sign off.
@@TTY W,n	All	Changes the maximum character width of page from the default 80 characters to n characters wide. In most cases, the maximum page width should be set to 132.

TABLE 6-3. NCC DEMAND ACCESS TELEPHONE NUMBERS

State	City	Telephone
Alabama	Montgomery	205/277-9390
California	San Francisco	415/546-1395
Colorado	Denver	303/837-0843
Connecticut	Wethersfield	203/529-3378
District of Columbia	Washington	202/966-9510
Georgia	Athens	404/549-3882
	Atlanta	404/873-6431
Illinois	Chicago	312/663-1640
Louisiana	New Orleans	504/566-0041
Massachusetts	Boston	617/742-0420
Michigan	Grosse Ile	313/675-8936
	Lansing	517/485-3220
Minnesota	Minneapolis	612/861-7451
Missouri	Kansas City	816/474-3540
Nevada	Las Vegas	702/736-1988
New York	New York	212/233-1604
North Carolina	Raleigh/Durham	919/541-2000
Ohio	Cincinnati	513/751-5800
Pennsylvania	Philadelphia	215/925-4407
South Carolina	Columbia	803/256-1018
Tennessee	Nashville	615/244-8020
Texas	Dallas	214/651-1723
Washington	Seattle	206/682-6456
All other locations (toll free)		800/424-3690

`C*UNIVAC 1100 OPERATING`
`SYSTEM VER.`
`33R0030-315A(RSI)*`
	This header message is usually followed by several lines of text indicating special news which can be obtained. When the solicitation symbol (>) is received you are ready to enter a valid @RUN card.

`>@@tty w,nnn#`	where nnn = the maximum width of the page in characters (usually 132). This command may be omitted if terminal is limited to 80 characters.
`-@@ COMPLETE`	Indicates that the @@TTY command has been executed.
`>@run nnxxx,account` `number,eads,15#`	where nnxxx = the RUNID. Usually this begins with a number that designates an output receiving bin at the NCC followed by the user's initials. Please consult the NCC User Reference Manual or call User Services for more information. account no. = the NCC account number as given. eads = the project code which enables access to the GEDS data base and software. <u>No other project code may be used</u>.
`DATE: 011580 TIME: 135248` `>`	This is the system response if a valid @RUN card has been entered, followed by the >. NOTE: If your terminal can print more than 80 characters across the page, you may wish to expand the page width as shown above.

At this point, the computer is ready to receive instruction for accessing the data base or for executing EADS retrieval or analytical software. For users who are knowledgeable in SYSTEM 2000® natural language, Section 6.6.3 describes the accessing procedure.

6.6.2 Terminating a Demand Processing Session

Two commands are required to end a demand processing session -- the @FIN and the @@TERM. The @FIN command ends the run and results in the printing of summary usage and accounting data, and places the terminal in the inactive mode. The @@TERM command ends the session by disconnecting the terminal from the computer.

A typical sequence is as follows (# denotes carriage return):

```
>@fin#                                        (Enter the @FIN command)

RUNID:     XXXXX    ACCT:     XXXXXXXXXX      PROJECT:    EADS
TIME:               TOTAL:    00:00:35.510    CBSUPS:     001854139
                    CAU:      00:00:00.177    I/O:        00:00:08.822
                    CC/ER:    00:00:26.509    WAIT:       00:02:36.079
SRC:                PS =        000130352     ES =          000276035
SRUS:  00:01:41.027 COST:   $005.05
IMAGES READ:  78    PAGES:  3
START:  13:52:47    JANUARY 15, 1980   FIN:   13:57:50  JANUARY 15, 1980
*TERMINAL INACTIVE*

>@@term#                                      (Enter the @@ TERM command)
```

6.6.3 Accessing the EADS

Read-only access to the data base is granted to users of the EADS who use this procedure. Users are cautioned not to attempt to use this procedure unless they are familiar with SYSTEM 2000® natural language. The sequence is as follows (# denotes carriage return):

```
>@add eads.start#                         (Enter the @ADD command.)

01/15/80    17:09:07     BEGIN SYSTEM 2000     VERSION 2.80D

---

-556- ASSIGNED...EADS-EADS    12    28443    01/15/80    11:44:14

---

---
>
```

At this point, the system is ready to accept valid SYSTEM 2000® commands. The session may be ended by using the EXIT: command, which produces the trailer banner and returns to control mode with the input solicitation character (>) given.

```
> exit:#

 01/15/80    17:14:52    END    SYSTEM 2000    VERSION 2.80D
>
```

The demand processing session may be terminated by using the procedure given in Section 6.6.2.

Any attempts to change or modify the data base in any way will result in the following diagnostic message:

```
-864- COMMAND NOT AVAILABLE IN SHARED MODE -

---
>
```

6.7 REMOTE BATCH TERMINAL OPERATION

Batch processing, whether remote or local submittal, implies that discrete jobs are submitted to the NCC UNIVAC 1100 from cards or some similar form. If local, card decks are submitted to the I/O Control Clerk and then loaded into the computer; if remote, cards are read into the computer through a high-speed remote job entry (RJE) terminal which has been connected to the computer via telephone data link.

Remote batch terminal operation with the NCC UNIVAC 1100 is currently supported under the UNIVAC 1004 and NTR (9000 Remote) terminal protocols. This means that a variety of commercial RJE terminals which are capable of emulating (or looking like) a U-1004 or NTR terminal may be used to access the NCC UNIVAC 1100. A partial list of RJE terminals which satisfy one or more of these conditions includes the following:

DATA 100 Models 74, 76, and 78
COPE RJE Terminals
Harris RJE Terminals
UNIVAC 1004
UNIVAC 9200 NTR

If you are uncertain regarding the compatibility of a particular terminal with the NCC UNIVAC 1100, you should contact the following:

NCC User Services
919/541-3649
FTS: 629-3649

All RJE terminals are identified to the NCC UNIVAC 1100 by a unique SITE ID which is assigned by the MIDSD TSSMS Office at Research Triangle Park, North Carolina. Figure 6-2 gives an example of the form required for batch terminal support. The completed form is submitted to the appropriate ADP coordinator (through the EPA project officer if required) for approval and signature.

Organization: ______________________________

Terminal manufacturer & model number: ____________________

If programmable, what UNIVAC terminal does the terminal emulate?

____

Hours of Operation: From __________ To __________ EDT

Person responsible:
Name ______________________________
Title ______________________________
Mailing Address ______________________________
____
____

Telephone -- FTS ____________________ Ext. ________
-- Commercial ____________________ Ext. ________
Comments: ______________________________
____
____

ADP Coordinator ____________________ Date ________

THE FOLLOWING TO BE COMPLETED BY NCC

SITE-ID ____________________
____

Telephone numbers to use:
FTS ______________
____
____
Commercial ______________
____

Contacts: User Services
FTS 629-3649
919/541-3649

Central Computer Operations:
Day: ____________________
____
Night: ____________________

Mailing Address:
National Computer Center
U.S. EPA
Research Triangle Park
North Carolina 27711

Hours available for operation:
Weekdays: ____ to ____ EDT
Saturday: ____ to ____ EDT
Sunday: ____ to ____ EDT
Holidays: ____ to ____ EDT

Comments: ______________________________
____
____

Figure 6-2. Request for Batch Terminal Support Form.

The batch SITE ID is of the form DATAXX and must be transmitted to the NCC UNIVAC 1100 at sign-on before any processing can be initiated.

6.7.1 Initiating a Remote Batch Processing Session

Communications are established with the NCC UNIVAC 1100 through data communication modems over voice-grade telephone lines. The NCC UNIVAC 1100 will support RJE processing only at 4800 bits/second (BPS) transmission rate. A list of nationwide RJE telephone access numbers for the NCC is given in Table 6-4.

Batch processing through an RJE terminal essentially means that the terminal-to-computer data link must be established and the computer card deck must be read into the computer in a prescribed manner. Since this procedure varies dramatically among terminal vendors, the user should refer to his terminal hardware operating manual for the appropriate procedure. If any problems or questions arise, the user should contact NCC User Services.

6.7.2 Terminating a Remote Batch Processing Session

The termination of a remote batch processing session depends upon which UNIVAC RJE terminal is being used (or emulated). The user should consult his terminal hardware operations manual for the correct procedure.

TABLE 6-4. NCC REMOTE BATCH ACCESS TELEPHONE NUMBERS

Location	Transmission Rate (BPS)	Telephone
Continental U.S. (toll outside RTP)	4800	919/541-2094 (3 lines)
Continental U.S. (except NC) (toll free)	4800	800/334-9761 (8 lines)

NOTE: 4800 BPS transmission requires Bell 208B dataset or equivalent.

6.8 EADS USER SUPPORT

IERL/RTP is committed to the on-going support of the EADS and its associated software. The administrative functions relative to the EADS are provided by the Special Studies Staff in IERL. Technical development and maintenance is provided by the EADS Support Staff, which is composed of government contractors under the direction of the EADS Program Manager. The EADS Technical Support Staff has the responsibility for conducting the data QA program, updating documentation, developing analytical software specifications, conducting information transfer activities, etc. This function is being provided by Acurex Corporation in Mountain View, California, and Midwest Research Institute in Kansas City, Missouri. Data processing activities are also performed by Acurex Corporation in its offices located at Research Triangle Park, North Carolina.

Any questions regarding the EADS should be directed to the EADS Program Manager or the EADS Technical Support Staff. Their names, addresses, and phone numbers are listed on page xi.

Problems relating to the operation of the NCC UNIVAC 1100, to data communications, etc., are not the responsibility of the EADS Technical Support Staff. These questions should be addressed to:

User Services
National Computer Center (MD-34B)
U.S. Environmental Protection Agency
Research Triangle Park, North Carolina 27711
FTS: 629-3649
Commercial: 919/541-3649

SECTION 7

PROGRAM LIBRARY

7.0 INTRODUCTION

The usefulness and usability of industrial discharge data which have been compiled into a computerized information system is limited if the data cannot be retrieved and utilized to answer questions that a user might have. As discussed previously, the employment of the SYSTEM 2000® data base management system provides a flexible set of commands that can often answer many questions. SYSTEM 2000® Natural Language, as this command language is called, is a powerful tool for the knowledgeable user; that is, the user who is familiar with or has received training in the use of SYSTEM 2000®. The Natural Language commands are limited, however, especially when there is a need to perform calculations using the data or when a special formatted report is required. In addition, most EADS users are not likely to undertake training in the use of SYSTEM 2000® Natural Language, nor should these users be expected to have any particular expertise in the use of computers or computer programs. This means that no user of the EADS should be required to have any special computer-related training in order to use the EADS data bases.

In order to provide greater flexibility to the user and to simplify the retrieval of data, an extensive program library is being developed for the EADS. The programs described in the following subsections are applicable to one or more of the waste stream data bases contained in the EADS.

Each entry in the program library is described by a brief abstract which identifies in general terms the input required from the user and the output to be expected. Some programs will be applicable to both demand (interactive) processing and batch processing, and step-by-step instructions for executing the program in both modes are given when appropriate. For demand processing, it is assumed that the user has successfully established communications with the UNIVAC U-1100 computer as described in Section 6 of this user guide. In like manner, batch users are assumed to have established communications with the UNIVAC U-1100 through a remote terminal device or have the capability of submitting run requests locally at the EPA National Computer Center at Research Triangle Park, NC. All input requirements for each program are listed and a sample (or representative) output is provided. Any comments pertaining to the use of the program which may be helpful to the user are also given.

As new user programs are developed and made available to the EADS user community, this section will be expanded.

7.1 SERIES REPORT

7.1.1 Applicability: FPEIS, GEDS, LEDS, SDDS

7.1.2 Abstract

The SERIES Report is the basic report for the EADS waste stream data bases. This report lists all of the data contained in the test series by stream, test operating level, and sample. The length of the SERIES Report will depend upon the quantity of data contained in the test series.

The format of the SERIES Report follows the structure of the EADS data base. The first page of the report describes the source that was sampled, identifies the sponsor of the testing and the organization which did the actual testing, and provides any commentary on the test series which was included. Beginning with the second page, the Report describes the effluent stream level, including the control/treatment technology design parameters. Following this, the test operating level is reported which includes the control/treatment technology operating parameters and the description of the source fuel or feed material. Next, the sample level and any subsequent components are described. These data include the chemical, radiological, and biological analysis results. The chemical data may include Level 1 Environmental Assessment data as well as compound-specific data for inorganics and organics. The chemical and radiological data for various sampling components are summarized by chemical/radiological species (or Level 1 fraction).

For the FPEIS, the SERIES Report provides calculated particle size distributions for impaction-type sampling equipment including cumulative mass concentrations, geometric mean diameters, etc. Where other types of samples are used, the mass or number concentration is provided. The data are given as a function of particle size; that is, as a function of components of the sampling system.

The SERIES Report may be run by inputting the TSN and the data base name. The Report may be initiated only through a "demand" terminal session although the SERIES program is only executed as a batch job. The demand session gives complete instructions for using the SERIES Report program.

7.1.3 User Data Required

- EADS Data Base Name (FPEIS, LEDS, GEDS, and/or SDDS)
- Valid TSN (or range of TSN's)

7.1.4 Data Qualification Required

None

7.1.5 Limitations/Restrictions

The SERIES Report program user has several printing options available, including the NCC local printers, remote high-speed terminal printers, and low-speed time-sharing (demand) terminals. Because of the length of the SERIES Report for most of the test series, it is recommended that the low-speed terminal option be avoided where possible.

7.1.6 Functional Description

Using the EADS waste stream data base name and the TSN, the selected test series is retrieved and printed in its entirety. Multiple SERIES Reports may be initiated during one session.

7.1.7 User Instructions -- Demand

File name: EADS.SERIES

The SERIES Report program may be accessed through a "demand", or time-sharing, terminal (see Section 6.6), which can access the U-1100 computer. User access through the demand terminal allows the program to be executed as a batch job. The user should initiate the demand session by following the procedures outlined in Section 6.6.1. When the session is completed, the demand session may be ended by following the instructions given in Section 6.6.2.

(In the following computer-generated instructions, the response by the user is underlined.)

```
>@ADD  EADS.SERIES                 (Enter the file name)

CTS    6R1    16:21:01

THE ASSUMED MODE IS FIELDDATA

DO YOU NEED INSTRUCTIONS?>  YES    (Enter YES or NO)

THIS MODULE IS DESIGNED TO RUN THE SERIES REPORT FOR ANY VALID TEST SERIES
NUMBER AND DATA BASE NAME ENTERED.  INFORMATION REQUIRED TO RUN THIS
ROUTINE WILL BE ENTERED BY THE USER AS PROMPTED BY THIS MODULE.
```

(If the answer to the preceding question had been NO, the above statements would be skipped.)

```
ENTER YOUR ACCOUNT NUMBER:>        (Enter a valid NCC Account Number)

ENTER THE DATA BASE NAME           (Enter the data base name)

(FPEIS, LEDS, GEDS, OR SDDS):>

IS THE SERIES NUMBER IN A RANGE (YES OR NO)?> YES

YOUR REQUEST IS A CONTINUOUS RANGE

ENTER THE FIRST SERIES NUMBER:>    (Enter the first TSN)

ENTER THE LAST SERIES NUMBER:>     (Enter the last TSN)
```

(If the response to the range question is NO, the above statements are skipped. The computer will prompt the user with the following question.)

```
ENTER THE TEST SERIES NUMBER:>        (Enter the TSN)

ENTER THE NUMBER OF COPIES            (Enter the number of copies wanted)
IF 1, JUST PRESS RETURN:>

DO YOU REQUIRE SPECIAL FORMS?> NO     (Enter YES or NO)
```

(If YES had been entered, the program would request the forms ID. Please consult the NCC User Reference Manual or the EADS Program Manager before attempting to use this feature. The NO response means that standard, one-part computer paper will be used.)

```
ENTER THE PRINT DESTINATION IF IT IS
TO BE OTHER THAN THE MAIN PRINTER:>
```

(If there is no preference, press the return key. If the output is to be a remote high-speed terminal, enter the site ID of the terminal. If a user demand terminal is to receive the output, enter the user ID for that terminal user.)

```
ARE YOU FINISHED (YES OR NO)?>        (Enter YES or NO)
```

(If additional selections are to be made, enter NO and the program will prompt for the data base name selection. If YES, there will be a normal exit.)

Please refer to Section 7.1.9 for sample runs of the demand SERIES Report program. An example of the SERIES Report is given in Section 7.1.10.

7.1.8 User Instructions -- Batch

Batch (card input) processing of the SERIES Report program is not available.

7.1.9 Sample Demand Runs

(To be added later.)

7.1.10 Sample SERIES Report

(To be added later.)

7.2 CHEMICAL SEARCH PROGRAM (CHEM-SEARCH)

7.2.1 Applicability: FPEIS, GEDS, LEDS, SDDS

7.2.2 Abstract

The Chemical Search Program (CHEM-SEARCH) enables the user to search all or part of the EADS waste stream data bases to determine the presence of a particular chemical species. The user may identify the chemical species by its Chemical Abstracts Services (CAS) Number, its Multimedia Environmental Goals (MEG) Number, or its empirical formula. If a search is to be made of part of a data base, the data base name must be given and the range of TSN's must be specified. Both demand and batch versions of the program are available to the user. The demand version provides complete instructions on the use of the program through an interactive interface with the user. A "Help" command is also available to users who encounter problems.

The output from the CHEM-SEARCH program provides additional information on the chemical species selected, including the MEG ID Number, CAS Number, empirical formula, preferred name, molecular weight, other names by which the chemical is known, and whether or not the chemical is designated as a priority pollutant, hazardous pollutant, or both. For each data base scanned, the TSN is listed for those test series in which the chemical of interest is reported. The program does not report the concentration of the chemical species. The selection criteria requires only that the chemical species be found once in a given test series even though multiple occurrences of the chemical may be present. It is recommended that the user request the SERIES Report for each test series identified in order to get more information.

7.2.3 User Data Required

- Valid Chemical ID Code (MEG ID or CAS Number) or Empirical Formula
- EADS Data Base Name (FPEIS, LEDS, GEDS, and/or SDDS)
- Range of TSN's (optional)

7.2.4 Data Qualification Required

None

7.2.5 Limitations/Restrictions

The user is cautioned to use care when selecting the empirical formula format option for organic compounds. Since several organic compounds of the same class may have the same formula (e.g., isomers), it would likely be safer to search on the basis of the MEG ID or the CAS Number.

7.2.6 Functional Description

Using the user-supplied data on a particular chemical species, the CHEM-SEARCH program initially checks the EADS Chemical Data Table (CDT) to verify that a valid species has been requested. If so, both the MEG ID and CAS Number are retrieved. The program next scans all of the data bases specified using both the MEG ID and the CAS Number to search for the chemical. If at least one occurrence of the species is found within a test series, that test series is listed in the output. If no data are found in the entire data base, this fact is also listed in the output.

7.2.7 User Instructions -- Demand File name: EADS.RUN/CHEM-SEARCH

The CHEM-SEARCH program may be accessed through a "demand," or time-sharing, terminal (see Section 6.6), which can access the U-1100 computer. User access in demand mode enables the program to be run in "real time"; that is, the results are returned directly to the user.

The user shall initiate a demand session by following the procedures outlined in Section 6.6.1. When the session is completed, the session may be ended by following the procedures given in Section 6.6.2.

(In the following computer-generated instructions, the response by the user is underlined.)

```
>@ADD EADS.RUN/CHEM-SEARCH          (Enter the file name)

DO YOU NEED INSTRUCTIONS?           (Enter YES or NO)

>YES

INSTRUCTIONS WILL BE LISTED SEVERAL LINES AT A TIME AND THEN STOP.  TO
CONTINUE DEPRESS CARRIAGE RETURN.
THIS PROGRAM WILL LIST TEST SERIES NUMBERS FROM THE EADS DATA BASE WHICH
HAVE USER SPECIFIED CHEMICALS REPORTED IN THEIR ANALYSIS DATA.  THE USER
MUST IDENTIFY THIS CHEMICAL TO THE PROGRAM BY USING MEG, CAS ID NUMBERS OR
EMPIRICAL FORMULA.

>(CR)


     THE FORMAT USED IS:

M/MMMMMM     -  FOR THE MEG NUMBER -- OR --

C/CCCCC-CC-C - FOR THE CAS NUMBER -- OR --

F/XXXXXXX... - FOR THE EMPIRICAL FORMULA.

>(CR)


THE USER HAS THE OPTION OF SPECIFYING WHICH DATA BASE SERIES ARE TO BE
LISTED (FPEIS, GEDS, LEDS, OR SDDS).  ADDITIONALLY, THE USER MAY LIMIT THE
LIST TO SPECIFIC RANGES, ONE PER DATA BASE.

TO SPECIFY A RANGE FOR ANY DB, THE USER MUST SELECT A "PARTICULAR" DATA
BASE WHEN QUERIED.  "STOP" AND "HELP" MAY BE ENTERED AT ANY TIME.  "STOP"
WILL EXIT THE PROGRAM.  "HELP" WILL BRIEFLY LIST THE MAJOR QUERY RESPONSE
FORMATS.  (IMPORTANT -- ANY QUERY LISTED PRIOR TO A "HELP" REQUEST WILL
NOT BE SHOWN AGAIN AFTER THE "HELP" RESPONSE FROM THE PROGRAM.)

>(CR)
```

(If the reply to the above question is NO, the preceding statements are skipped.)

```
ENTER THE CODE/CHEMICAL ID (FORMULA) (Use the format described above)
>C/00067-66-3

DO YOU WISH A PARTICULAR DATA BASE?  (Enter YES or NO)
>YES

ENTER THE DATA BASE TO BE SELECTED   (Enter LEDS, GEDS, SDDS, or FPEIS)
>LEDS

DO YOU WISH TO SELECT WITHIN A       (Enter YES or NO)
RANGE OF LEDS TEST SERIES?
>YES

ENTER THE MINIMUM NUMBER IN THE      (Enter the TSN)
RANGE
>01

ENTER THE MAXIMUM NUMBER IN THE RANGE
>10
```

(If no particular data base is named, CHEM-SEARCH will scan all entries in all four data bases. This is a lengthy sort and it is better to request each data base separately. When the data base is specified, the user may restrict the search to only a portion of the data base as shown. If a range is not requested by the user, the last two queries are skipped, and the entire data base is scanned.)

```
ENTER THE ADDITIONAL DATA BASE TO BE SELECTED/CORRECT A PREVIOUS
ENTRY/"END" OR CARRIAGE RETURN IF COMPLETE:
>END
```

(If a data base name is entered, the program will again ask if a range is requested and the ensuing steps are repeated. If END is entered, the program starts to execute. Typical output is as follows.)

```
CHLOROFORM (TRICHLOROMETHANE)
MEG:   02A100   CAS:   00067-66-3   FORMULA:   CHCL3
MOLECULAR WEIGHT:   119.38   PRIORITY POLLUTANT
                             HAZARDOUS POLLUTANT
OTHER NAMES:  METHANE TRICHLORIDE
              TRICHLOROMETHANE

LEDS
----
00001
00002
00003
00004
00005
00006
00007
00008
00009
00010
*** NORMAL END ***

>
```

At this point, the terminal is returned to the Control Mode; that is, the program has finished and the user may now enter additional commands.

The CHEM-SEARCH program is very flexible and has a number of options available to users. This flexibility is best seen through the sample demand runs given in Section 7.2.9. Use of the "HELP" option is also shown there.

7.2.8 User Instructions -- Batch

The CHEM-SEARCH program may also be executed as a batch job on the UNIVAC U-1100 using punched card input. It is assumed that the user has card input access to the U-1100 computer either through "across the counter" submitted at Research Triangle Park, NC, or through a remote batch terminal.

In order to run the CHEM-SEARCH program in batch mode, the user should submit the following cards:

```
@RUN,R/RS Run ID,Account Number,EADS,5,50/50
@ASG,A EADS.
@XQT,BHZ EADS.CHEM-SEARCH
. . . parameter cards . . .
@FIN
```

There are three types of parameter cards defined for CHEM-SEARCH and they are used to drive the program. The Type 1 Parameter Card identifies the chemical to be requested in terms of its MEG ID Number, CAS Number, or empirical formula. The Type 2 Parameter Card identifies the data base to be selected and specifies the range of TSN's to be searched. The Type 3 Parameter Card is the END card which indicates to the program that the input data have been completed.

The formats for the parameter cards are as follows:

```
              Card Col.         12345678
Type 1:                         M/AAAAAA
                          or    C/BBBBB-BB-B
                          or    F/DDDDD...
```

where all data begin in column 1 of the card and:

M identifies the MEG Number AAAAAA;

C identifies the CAS Number BBBBB-BB-B; and

F identifies the Empirical Formula DDDD....

```
                                         1         2
Type 2:       Card Col.         12345678901234567890
                                DBDBD MINXX-MAXZZ
```

where DBDBD identifies the data base name beginning in column 1 (choose FPEIS, GEDS, LEDS, or SDDS),

MINXX is the starting TSN in the range of TSN's to be specified. The TSN should be entered as a right-justified integer number in card columns 7-11,

- (enter a dash in card column 12)

MAXZZ is the last TSN in the range of TSN's to be specified. The TSN should be entered as a right-justified integer number in card columns 13-17.

Note If no range of TSN's is requested (that is, if the entire data base is to be searched), leave card columns 7-17 blank.

Also, if one end of the TSN's range is entered, the other is required also. A Type 2 parameter card must be included for each data base requested. The order of the Type 2 cards is not important.

```
Type 3:          Card Col.          123
                                    END
```

This card signifies the end of the data. It should be the last parameter card included in the card deck.

Caution The parameter cards must be entered into the card deck in the following order:

Type 1

All Type 2

Type 3

Sample print-outs from CHEM-SEARCH are included in Section 7.2.10.

7.2.9 Sample Demand Runs

(1) MEG ID Number Format:

```
>@ADD EADS.RUN/CHEM-SEARCH
DO YOU NEED INSTRUCTIONS?
>NO

ENTER THE CODE/CHEMICAL ID (FORMULA)
>M/02A065
```

```
CHEMICAL DATA NOT FOUND FOR:   M/02A065
WOULD YOU LIKE TO TRY AGAIN?
>YES
ENTER THE CODE/CHEMICAL ID (FORMULA)
>M/02A100
DO YOU WISH A PARTICULAR DATA BASE?
>YES

ENTER THE DATA BASE TO BE SELECTED
>LEDS
DO YOU WISH TO SELECT WITHIN A RANGE OF LEDS TEST SERIES?
>NO

ENTER THE ADDITIONAL DATA BASE TO BE SELECTED/CORRECT A
PREVIOUS ENTRY/"END" OR CARRIAGE RETURN IF COMPLETE:
>END

CHLOROFORM (TRICHLOROMETHANE)
MEG:  02A100   CAS:  00067-66-3    FORMULA:  CHCL3
MOLECULAR WEIGHT:  119.38          PRIORITY POLLUTANT
                                   HAZARDOUS POLLUTANT
OTHER NAMES:  METHANE TRICHLORIDE
              TRICHLOROMETHANE

LEDS
----
00001
00002
00003
00004
00005
00006
00007
00008
00009
00010
00011
00143
00144
00145
00147
00148
00150
00151
00152
00153

*** NORMAL END ***

>
```

(2) Chemical Formula Format:

Caution: Be careful using this format for organic chemicals where isomers may be encountered.

```
>@ADD EADS.RUN/CHEM-SEARCH

DO YOU NEED INSTRUCTIONS?
>NO

ENTER THE CODE/CHEMICAL ID (FORMULA)
>F/CHCL3
DO YOU WISH A PARTICULAR DATA BASE?
>YES

ENTER THE DATA BASE TO BE SELECTED
>LEDS
DO YOU WISH TO SELECT WITHIN A RANGE OF LEDS TEST SERIES?
>YES
ENTER THE MINIMUM NUMBER IN THE RANGE
>01
ENTER THE MAXIMUM NUMBER IN THE RANGE
>5

ENTER THE ADDITIONAL DATA BASE TO BE SELECTED/CORRECT A
PREVIOUS ENTRY/"END" OR CARRIAGE RETURN IF COMPLETE:
>FPEIS
DO YOU WISH TO SELECT WITHIN A RANGE OF FPEIS TEST SERIES?
>NO

ENTER THE ADDITIONAL DATA BASE TO BE SELECTED/CORRECT A
PREVIOUS ENTRY/"END" OR CARRIAGE RETURN IF COMPLETE:
>END

CHLOROFORM (TRICHLOROMETHANE)
MEG:   02A100    CAS:   00067-66-3    FORMULA:   CHCL3
MOLECULAR WEIGHT:   119.38            PRIORITY POLLUTANT
                                      HAZARDOUS POLLUTANT

OTHER NAMES:  METHANE TRICHLORIDE
              TRICHLOROMETHANE

LEDS
----
00001
00002
00003
00004
00005
```

```
NO FPEIS SERIES FOUND IN ENTIRE DATA BASE

*** NORMAL END ***

>
```

(3) Use of HELP Command:

```
>@ADD EADS.RUN/CHEM-SEARCH

DO YOU NEED INSTRUCTIONS?
>NO
ENTER THE CODE/CHEMICAL ID (FORMULA)
>F/C2CL4
DO YOU WISH A PARTICULAR DATA BASE?
>HELP
"STOP" WILL EXIT PROGRAM
"M/MMM..,C/CCCCC-CC-C,F/XXXXX...
WILL SEARCH BY CHEMICAL
"FPEIS", "GEDS", "LEDS" or "SDDS" WILL SELECT A DATA BASE,
"END" MEANS END OF SOLICITATION FOR A DATA BASE.
>YES

ENTER THE DATA BASE TO BE SELECTED
>FPEIS
DO YOU WISH TO SELECT WITHIN A RANGE OF FPEIS TEST SERIES?
>YES
ENTER THE MINIMUM NUMBER IN THE RANGE
>1
ENTER THE MAXIMUM NUMBER IN THE RANGE
>5

ENTER THE ADDITIONAL DATA BASE TO BE SELECTED/CORRECT A
PREVIOUS ENTRY/"END" OR CARRIAGE RETURN IF COMPLETE:
>LEDS
DO YOU WISH TO SELECT WITHIN A RANGE OF LEDS TEST SERIES?
>YES

ENTER THE MINIMUM NUMBER IN THE RANGE
>5
ENTER THE MAXIMUM NUMBER IN THE RANGE
>10

ENTER THE ADDITIONAL DATA BASE TO BE SELECTED/CORRECT A
PREVIOUS ENTRY/"END" OR CARRIAGE RETURN IF COMPLETE:
>END

TETRACHLOROETHENE
MEG:   02B080    CAS:   00127-18-4     FORMULA:   C2CL4
MOLECULAR WEIGHT:   165.83             PRIORITY POLLUTANT
                                       HAZARDOUS POLLUTANT
```

```
OTHER NAMES:   ETHYLENE TETRACHLORIDE
               PERCHLOROETHYLENE
               TETRACHLOROETHYLENE

LEDS
----
00005
00006
00007
00008
00009
00010

NO FPEIS SERIES FOUND BETWEEN SERIES 00001 and 00005

*** NORMAL END ***

>
```

(4) CAS Number Format:

```
>@ADD EADS.RUN/CHEM-SEARCH

DO YOU NEED INSTRUCTIONS?
>NO
ENTER THE CODE/CHEMICAL ID (FORMULA)
>C/00127-18-4
DO YOU WISH A PARTICULAR DATA BASE?
>YES

ENTER THE DATA BASE TO BE SELECTED
>LEDS
DO YOU WISH TO SELECT WITHIN A RANGE OF LEDS TEST SERIES?
>YES
ENTER THE MINIMUM NUMBER IN THE RANGE
>29
ENTER THE MAXIMUM NUMBER IN THE RANGE
>39

ENTER THE ADDITIONAL DATA BASE TO BE SELECTED/CORRECT A
PREVIOUS ENTRY/"END" OR CARRIAGE RETURN IF COMPLETE:
>END

TETRACHLOROETHENE
MEG:   02B080   CAS:   00127-18-4   FORMULA:  C2CL4
MOLECULAR WEIGHT:   165.83          PRIORITY POLLUTANT
                                    HAZARDOUS POLLUTANT

OTHER NAMES:   ETHYLENE TETRACHLORIDE
               PERCHLOROETHYLENE
               TETRACHLOROETHYLENE
```

```
NO LEDS SERIES FOUND BETWEEN SERIES 00029 AND 00039

*** NORMAL END ***

>
```

(5) Example of User Aborted Run:

```
>@ADD EADS.RUN/CHEM-SEARCH

DO YOU NEED INSTRUCTIONS?
>NO
ENTER THE CODE/CHEMICAL ID (FORMULA)
>M/02P101

CHEMICAL DATA NOT FOUND FOR:   M/02P101
WOULD YOU LIKE TO TRY AGAIN?
>NO
```

(6) Invalid Data Format/Data Not Found:

```
>@ADD EADS.RUN/CHEM-SEARCH
DO YOU NEED INSTRUCTIONS?
>NO
ENTER THE CODE/CHEMICAL ID (FORMULA)
>C/01A001
INVALID CAS FORMAT (01A001    )

CHEMICAL DATA NOT FOUND FOR:   C/01A001
WOULD YOU LIKE TO TRY AGAIN?
>YES
ENTER THE CODE/CHEMICAL ID (FORMULA)
>M/001A001

CHEMICAL DATA NOT FOUND FOR:   M/001A001
WOULD YOU LIKE TO TRY AGAIN?
>YES
ENTER THE CODE/CHEMICAL ID (FORMULA)
>M/01A100
DO YOU WISH A PARTICULAR DATA BASE?
>YES

ENTER THE DATA BASE TO BE SELECTED
>LEDS
DO YOU WISH TO SELECT WITHIN A RANGE OF LEDS TEST SERIES?
>NO

ENTER THE ADDITIONAL DATA BASE TO BE SELECTED/CORRECT A
PREVIOUS ENTRY/"END" OR CARRIAGE RETURN IF COMPLETE:
>END
```

```
PENTANES
MEG:   01A100    CAS:                 FORMULA:   C5H12
MOLECULAR WEIGHT:   72.15

NO LEDS SERIES FOUND IN ENTIRE DATA BASE

*** NORMAL END ***

>
```

7.2.10 Sample Batch Runs

The sample batch run outputs demonstrate the flexibility of the CHEM-SEARCH program in satisfying user needs. The user input cards (which are listed in the output) are underlined.

(1) MEG ID Format:

```
@RUN,D/RS   Run ID,Account Number,EADS,10,20

@ASG,A  EADS.

@XQT,BHZ  EADS.CHEM-SEARCH
ENTER THE CODE/CHEMICAL ID
M/48A100

ENTER THE DATA BASE TO BE SELECTED
GEDS

ENTER THE DATA BASE TO BE SELECTED
LEDS    00001-00100

ENTER THE DATA BASE TO BE SELECTED
END

ELEMENTAL PHOSPHORUS
MEG:   48A100   CAS:   07723-14-0   FORMULA:   P
MOLECULAR WEIGHT:   30.97           HAZARDOUS POLLUTANT

OTHER NAMES:              BLACK PHOSPHORUS
                          RED PHOSPHORUS
                          WHITE PHOSPHORUS
                          YELLOW PHOSPHORUS

LEDS
----
00083
00089
00092
00093
```

```
00094
00095
00096

NO GEDS SERIES FOUND IN ENTIRE DATA BASE

*** NORMAL END ***

@FIN
```

(2) CAS Number Format:

```
@RUN,R/RS Run ID,Account Number,EADS,8,10

@ASG,A  EADS.
FAC WARNING   040000100000

@XQT EADS.CHEM-SEARCH
ENTER THE CODE/CHEMICAL ID (FORMULA)
0/00076-44-8

ENTER THE DATA BASE TO BE SELECTED
LEDS

ENTER THE ADDITIONAL DATA BASE TO BE SELECTED/CORRECT A
PREVIOUS ENTRY/"END" OR CARRIAGE RETURN IF COMPLETE:
FPEIS

ENTER THE ADDITIONAL DATA BASE TO BE SELECTED/CORRECT A
PREVIOUS ENTRY/"END" OR CARRIAGE RETURN IF COMPLETE:
END

HEPTACHLOR
MEG:   16PN03   CAS:    00076-44-8   FORMULA:   C10H5CL7
MOLECULAR WEIGHT:    373.35          PRIORITY POLLUTANT
                                     HAZARDOUS POLLUTANT
OTHER NAMES:    DRINOX
                HEPTAGRAN
                VELSICOL-104
LEDS
----
00058
00074
00076
00082
00089
00103
00113
00115
00116
00134
00140
```

```
NO FPEIS SERIES FOUND IN ENTIRE DATA BASE

*** NORMAL END ***

@FIN
```

(3) Empirical Formula Format:

```
@RUN,R/RS Run ID,Account Number,EADS,8,10
@ASG,A  EADS.
FAC WARNING   040000100000

@XQT EADS.CHEM-SEARCH
ENTER THE CODE/CHEMICAL ID (FORMULA)
F/C10H5CL7

ENTER THE DATA BASE TO BE SELECTED
LEDS

ENTER THE ADDITIONAL DATA BASE TO BE SELECTED/CORRECT A
PREVIOUS ENTRY/"END" OR CARRIAGE RETURN IF COMPLETE:
FPEIS

ENTER THE ADDITIONAL DATA BASE TO BE SELECTED/CORRECT A
PREVIOUS ENTRY/"END" OR CARRIAGE RETURN IF COMPLETE:
END

HEPTACHLOR
MEG:   16PN03   CAS:   00076-44-8   FORMULA:   C10H5CL7
MOLECULAR WEIGHT:   373.35          PRIORITY POLLUTANT
                                    HAZARDOUS POLLUTANT
OTHER NAMES:   DRINOX
               HEPTAGRAN
               VELSICOL-104

LEDS
----
00058
00074
00076
00082
00089
00103
00113
00115
00116
00134
00140
```

```
NO FPEIS SERIES FOUND IN ENTIRE DATA BASE

*** NORMAL END ***

@FIN
```

(4) Invalid Data/Input Error Format:

```
@RUN,R/RS Run ID,Account Number,EADS,8,10
@ASG,A  EADS.

@XQT EADS.CHEM-SEARCH
ENTER THE CODE/CHEMICAL ID (FORMULA)
C/00076-44-8

ENTER THE DATA BASE TO BE SELECTED
LEDS

ENTER THE ADDITIONAL DATA BASE TO BE SELECTED/CORRECT A
PREVIOUS ENTRY/"END" OR CARRIAGE RETURN IF COMPLETE:
FPEIS

ENTER THE ADDITIONAL DATA BASE TO BE SELECTED/CORRECT A
PREVIOUS ENTRY/"END" OR CARRIAGE RETURN IF COMPLETE:
1104A  NO DATA AVAILABLE ON ACCEPT            (Missing END Card)
ERROR ADDR:   015514   BDI:   000013

EXEC8 ERROR: CONTINGENCY TYPE-12 ERROR TYPE-03 CODE-00 AT PROG
ADD 012165
BDI'S: M-I=000013  M-D=000012  U-I=000000  U-D=000000
-800- SYSTEM ERROR CODE   816   x11 = 007255-
**** PLEASE NOTIFY DATA BASE ADMINISTRATOR ****
```

7.3 SERIES SUMMARY INFORMATION PROGRAM (SNAP-SHOT)

7.3.1 Applicability: FPEIS, GEDS, LEDS, SDDS

7.3.2 Abstract

The Series Summary Information Program (SNAP-SHOT) is a brief report which summarizes the contents of an EADS test series. The report gives an indication of "what" is contained in the test series without getting into details. It will provide the user with an overview of the test series in a brief format that would ordinarily require the obtaining of a more detailed and lengthy SERIES Report (see Section 7.1).

The formation of the SNAP-SHOT Report follows the SERIES Report very closely; it is as if a "snap-shot" had been made of the SERIES Report. The first page of the SNAP-SHOT Report is the same as the first page of the SERIES Report; that is, the source that was sampled is described in terms of its industrial categorization and location (if available); the sponsor of the testing and the organization which performed the work are identified; and any comments on the test series are provided. Any EADS test series which contain data from other media that were collected at the same time are identified and a list of references pertaining to the test series is provided. Next, a summary of the data to be found in the test series is given, including the type of waste or product streams reported, the type of control technology applied (if any), the number of discrete samples collected and whether they were collected from a control system inlet or outlet, and whether or not data are present for the sample on the results of inorganic/non-Level 1 organic analysis, Level 1 organic analysis, radionuclide analysis, and bioassay. Finally, the total number of effluent or product streams is given along with the total number of samples reported.

The SNAP-SHOT program may be qualified by any combination of five parameters to select several test series, or a specific range of test series may be specified by the user. The five parameters which may be chosen are as follows:

Source Category

Source Type

Product/Device

Process Type

Feed Material Category

Acceptable data for these parameters may be found in the Terminology Reference Manual in Table A-1 for the first four parameters and in Table A-2 for the Feed Material Category. The user may specify any combination of these parameters to retrieve summary information from a particular data base. For example, a user may request SNAP-SHOT reports for all test series where the Source Type equals UTILITY, Product/Device equals BOILER, and Feed Material Category equals COAL; that is, the user wants to identify all test series on coal-fired, utility boilers. The user is not required to utilize this parameter option. He may instead specify a single TSN or a range of TSN's.

The SNAP-SHOT program may be initiated either through a "demand" (time-sharing) session or through submitting a batch job. The demand version of the program prompts the user with complete instructions for its use.

7.3.3 User Data Required

- EADS Data Base Name (FPEIS, LEDS, GEDS, or SDDS)
- Valid TSN (or range of TSN's) or
- Source Category, Source Type, Product/Device, Process Type, and/or Feed Material Category

7.3.4 Data Qualification Required

If the Parameters Option is selected, the user may qualify the search for particular test series by inputting data for any combination of the parameters chosen. The acceptable data are combined in the Terminology Reference Manual in Table A-1 and Table A-2. This qualification is best shown by illustration in sections to follow.

7.3.5 Limitations/Restrictions

The SNAP-SHOT program user has several printing options available including the NCC local printers, remote high-speed terminal printers, and low-speed time-sharing (demand) terminals. While the SNAP-SHOT Report itself is not long (usually two to three pages), the volume of output could become voluminous, particularly if the Parameters Option is selected and the subsequent retrieval involves many test series. Unless the user is selecting a specific test series, it is recommended that the low-speed terminal option be avoided where possible.

7.3.6 Functional Description

Using the EADS waste stream data base name and the TSN(s) (or the source categorization parameters), the selected test series is (are) retrieved from the data base and the summary information is printed.

7.3.7 User Instructions -- Demand

File name: EADS.RUN/SNAP-SHOT

The SNAP-SHOT program may be accessed through a "demand", or time-sharing, terminal (see Section 6.6), which can access the U-1100 computer. User access through the demand terminal allows the program to be executed as a batch job. The user should initiate the demand session by following the procedures outlined in Section 6.6.1. When the session is completed, the demand session may be ended by following the instructions given in Section 6.6.2.

(In the following computer-generated instructions, the response by the user is underlined.)

```
>@ADD EADS.RUN/SNAP-SHOT          (Enter the file name)

CTS     6R1      16:21:01

THE ASSUME MODE IS FIELDATA

DO YOU NEED INSTRUCTIONS:>  YES      (Enter YES or NO)

THIS MODULE IS DESIGNED TO RUN THE SNAP-SHOT REPORT FOR ANY VALID TEST
SERIES NUMBER AND DATA BASE NAME ENTERED.  INFORMATION REQUIRED TO RUN
THIS ROUTINE WILL BE ENTERED BY THE USER AS PROMPTED BY THIS MODULE.

THE PARAMETERS OPTION ALLOWS THE USER TO SEARCH THE ENTIRE DATA BASE FOR
ALL TEST SERIES WHICH SATISFY THE SELECTION CRITERIA.

>(Press carriage return to continue)

THE PARAMETERS FOR WHICH VALUES MAY BE ENTERED ARE AS FOLLOWS:

          SOURCE CATEGORY
          SOURCE TYPE
          PRODUCT/DEVICE
          PROCESS TYPE
          FEED MATERIAL CATEGORY

>(Press carriage return to continue)

OTHERWISE, THE USER MAY ENTER A SINGLE TEST SERIES NUMBER OR A RANGE OF
TEST SERIES NUMBERS.

>(Press carriage return to continue)

(If the answer to the instructions question was NO, the above statements
would be skipped.)

ENTER YOUR ACCOUNT NUMBER:>         (Enter a valid NCC Account Number)

ENTER THE DATA BASE NAME            (Enter the data base name)
(FPEIS, LEDS, GEDS, or SDDS):>

DO YOU WISH TO SELECT THE PARAMETERS OPTION?
>YES                                (Enter YES or NO)

ENTER THE VALUE FOR THE PARAMETER AS PROMPTED.

IF NO DATA TO BE INPUT FOR THIS PARAMETER, PRESS RETURN.

SOURCE CATEGORY:>  (CR)             (Enter value from Table A-1,
                                    Terminology Reference Manual, or
                                    press return.)
```

```
SOURCE TYPE:>  UTILITY

PRODUCT/DEVICE:>  BOILER

PROCESS TYPE:>  (CR)

FEED MATERIAL CATEGORY:>  COAL      (Enter value from Table A-2,
                                     Terminology Reference Manual, or
                                     press return.)

ENTER THE NUMBER OF COPIES           (Enter the number of copies wanted)
IF 1, JUST PRESS RETURN:>  (CR)

DO YOU REQUIRE SPECIAL FORMS?>  NO   (Enter YES or NO)
```

(If YES had been entered, the program would request the forms ID. Please consult the NCC User Reference Manual or the EADS Program Manager before attempting to use this feature. The NO response means that standard, one-part computer paper will be used.)

```
ENTER THE PRINT DESTINATION IF IT IS TO BE OTHER THAN THE MAIN
PRINTER:>  (CR)
```

(If there is no preference, press the return key. If the output is to be a remote high-speed terminal, enter the site ID of the terminal. If a user demand terminal is to receive the output, enter the user ID for that terminal user.)

```
ARE YOU FINISHED (YES OR NO)?>       (Enter YES or NO)
```

(If additional selections are to be made, enter NO and the program will prompt for the data base name selection. If YES, there will be a normal exit.)

Please refer to Section 7.3.9 for sample runs of the demand SNAP-SHOT program. An example of the SNAP-SHOT Report is given in Section 7.3.11.

It should be emphasized that SNAP-SHOT does not actually execute as a demand (time-sharing) job. The demand routine creates a job stream which is processed as a batch job by the U-1100.

7.3.8 User Instructions -- Batch

The SNAP-SHOT program may also be executed as a batch job on the UNIVAC U-1100 using punched card input. It is assumed that the user has card input access to the U-1100 computer either through "across the counter" submitted at Research Triangle Park, NC, or through a remote batch terminal.

In order to run the SNAP-SHOT program in batch mode, the user should submit the following cards:

```
@RUN,R/RS RUN ID,Account Number,EADS,5,50/50
@ASG,A EADS.
@XQT,BHZ EADS.SNAP-SHOT
. . . parameter cards . . .
@FIN
```

Three types of parameter cards are used to identify the options selected and to drive the program. If the user wishes to print the SNAP-SHOT report for a specific TSN (or range of TSN's), the following Type 1 parameter card is used:

```
                             1         2
Type 1:    Card Col. 12345678901234567890
                     DBDBD MINXX-MAXZZ
```

where DBDBD identifies the data base name beginning in column 1 (choose FPEIS, GEDS, LEDS, or SDDS),

MINXX is the starting TSN in the range of TSN's to be specified. The TSN should be entered as a right-justified integer number in card columns 7-11,

- (enter a dash in card column 12)

MAXZZ is the last TSN in the range of TSN's to be specified. The TSN should be entered as a right-justified integer number in card columns 13-17.

Note If no range of TSN's is requested (that is, if a single test series is selected), leave card columns 12-17 blank.

If the user wishes to select the Parameters Option, then the Type 2 parameter cards should be used. Any or all of the following cards may be included in any order:

```
                              1         2         3         4
Type 2    Card Col.  1234567890123456789012345678901234567890
                     SOURCE CATEGORY     VVVV---------------V
                     SOURCE TYPE         VVVV---------------V
                     PRODUCT/DEVICE      VVVV---------------V
                     PROCESS TYPE        VVVV---------------V
                     FEED MATERIAL       VVVV---------------V
```

where VVVV----V is the valid value from Table A-1 or Table A-2 in the Terminology Reference Manual beginning in column 21, and not exceeding 20 characters in length.

Following the Type 1 or Type 2 cards, the Type 3 card is entered to indicate the end of the data. It should be the last parameter card in the deck before the @FIN card. The card has the following format:

```
Type 3:   Card Col. 123
                    END
```

Caution The parameter cards <u>must</u> be entered into the card deck in the following order:

Type 1 or Type 2
Type 3

Examples of batch runs of SNAP-SHOT are given in Section 7.3.10.

7.3.9 Sample Demand Runs

(1) SNAP-SHOT for a Specific TSN:

```
>@ADD EADS.RUN/SNAP-SHOT

DO YOU NEED INSTRUCTIONS?
>NO
ENTER YOUR ACCOUNT NUMBER:>  Account Number
ENTER THE DATA BASE NAME
(FPEIS, LEDS, GEDS, OR SDDS):>  FPEIS

DO YOU WISH TO SELECT THE PARAMETERS OPTION?
>NO
DO YOU WISH TO SELECT WITHIN A RANGE OF TEST SERIES?
>NO

ENTER THE TEST SERIES NUMBER:>  225
ENTER THE NUMBER OF COPIES
IF 1, JUST PRESS RETURN:>  2
DO YOU REQUIRE SPECIAL FORMS?:>  NO

ENTER THE PRINT DESTINATION IF IT IS TO BE OTHER THAN THE MAIN
PRINTER:>  (CR)

ARE YOU FINISHED (YES OR NO)?>  YES

*** NORMAL EXIT ***
```

(2) SNAP-SHOT for a Range of TSN's:

```
>@ADD EADS.RUN/SNAP-SHOT

DO YOU NEED INSTRUCTIONS?
>NO
ENTER YOUR ACCOUNT NUMBER:>  Account Number
ENTER THE DATA BASE NAME
(FPEIS, LEDS, GEDS, OR SDDS):>  FPEIS

DO YOU WISH TO SELECT THE PARAMETERS OPTION?
>NO
DO YOU WISH TO SELECT WITHIN A RANGE OF TEST SERIES?
>YES
ENTER THE MINIMUM NUMBER IN THE RANGE
>29
ENTER THE MAXIMUM NUMBER IN THE RANGE
>39

ENTER THE NUMBER OF COPIES
IF 1, JUST PRESS RETURN:>  2
DO YOU REQUIRE SPECIAL FORMS?:>  NO
```

```
ENTER THE PRINT DESTINATION IF IT IS TO BE OTHER THAN THE MAIN
PRINTER:>  (CR)

ARE YOU FINISHED (YES OR NO)?>  YES

*** NORMAL EXIT ***
```

7.3.10 Sample Batch Runs

(To be added later.)

7.3.11 Sample Output

(To be added later.)

7.4 BIOLOGICAL SEARCH PROGRAM (BIO-SEARCH)

7.4.1 Applicability: FPEIS, GEDS, LEDS, SDDS

7.4.2 Abstract

The Biological Search Program (BIO-SEARCH) enables the user to search all or part of the EADS waste stream data bases to determine the presence of the results of a particular bioassay test. The user may identify the bioassay results either by specifying the type of bioassay or the specific test name as found in the EADS Terminology Reference Manual Tables A-11 and A-12, respectively. If a search is to be made of part of a data base, the data base name must be given and the range of TSN's must be specified. Both demand and batch versions of the program are available to the user. The demand version provides complete instructions on the use of the program through an interactive interface with the user. A "Help" command is also available to users who encounter problems.

For each data base scanned, the TSN is listed for those test series in which the bioassay of interest is reported. The program does not report the results of the biological tests. The selection criteria requires only that the bioassay be found once in a given test series even though multiple occurrences of the assay may be present. It is recommended that the user request the SERIES Report for each test series identified in order to get more information.

7.4.3 User Data Required

- Valid Bioassay Test Type or Bioassay Test Name
- EADS Data Base Name (FPEIS, LEDS, GEDS, and/or SDDS)
- Range of TSN's (optional)

7.4.4 Data Qualification Required

None

7.4.5 Limitations/Restrictions

None

7.4.6 Functional Description

Using the user-supplied data on a particular bioassay test type or test name, the BIO-SEARCH program initially checks the data to verify that a valid bioassay test type or name has been requested. The program next scans all of the data bases specified using either the test type or the test name. If at least one occurrence of the assay is found within a test series, that test series is listed in the output. If no data are found in the entire data base, this fact is also listed in the output.

7.4.7 User Instructions -- Demand

File name: EADS.RUN/BIO-SEARCH

The BIO-SEARCH program may be accessed through a "demand", or time-sharing, terminal (see Section 6.6), which can access the U-1100 computer. User access in demand mode enables the program to be run in "real time"; that is, the results are returned directly to the user.

The user shall initiate a demand session by following the procedures outlined in Section 6.6.1. When the session is completed, the session may be ended by following the procedures given in Section 6.6.2.

(In the following computer-generated instructions, the response by the user is underlined.)

```
>@ADD EADS.RUN/BIO-SEARCH                               (Enter the file name)
DO YOU NEED INSTRUCTIONS?                               (Enter YES or NO)
>YES
INSTRUCTIONS WILL BE LISTED SEVERAL LINES AT A TIME AND THEN STOP.
TO CONTINUE DEPRESS CARRIAGE RETURN.
```

```
THIS PROGRAM WILL LIST TEST SERIES NUMBERS FROM THE EADS DATA BASE WHICH
HAVE USER SPECIFIED BIOASSAYS REPORTED IN THEIR ANALYSIS DATA.  THE USER
MUST IDENTIFY THIS BIOASSAY TO THE PROGRAM BY USING THE BIOASSAY TEST TYPE
OR TEST NAME.

>(CR)

       THE FORMAT USED IS:

           A/TESTTYPE - FOR THE BIOASSAY TEST TYPE
           B/TESTTYPE - FOR THE BIOASSAY TEST TYPE

>(CR)

THE USER HAS THE OPTION OF SPECIFYING WHICH DATA BASE SERIES ARE TO BE
LISTED (FPEIS, GEDS, LEDS, OR SDDS).  ADDITIONALLY, THE USER MAY LIMIT THE
LIST TO SPECIFIC RANGES, ONE PER DATA BASE.

TO SPECIFY A RANGE FOR ANY DB, THE USER MUST SELECT A "PARTICULAR" DATA
BASE WHEN QUERIED.  "STOP" AND "HELP" MAY BE ENTERED AT ANY TIME.  "STOP"
WILL EXIT THE PROGRAM.  "HELP" WILL BRIEFLY LIST THE MAJOR QUERY RESPONSE
FORMATS.  (IMPORTANT - ANY QUERY LISTED PRIOR TO A "HELP" REQUEST WILL NOT
BE SHOWN AGAIN AFTER THE HELP RESPONSE FROM THE PROGRAM.)

>(CR)
```

(If the reply to the above question is NO, the preceding statements are skipped.)

```
ENTER THE BIOASSAY TEST TYPE/NAME    (Use the format described above)

>A/CYTOTOXICITY

DO YOU WISH A PARTICULAR DATA BASE?  (Enter YES or NO)
>YES
ENTER THE DATA BASE TO BE SELECTED   (Enter LEDS, GEDS, SDDS, or FPEIS)
>LEDS
DO YOU WISH TO SELECT WITHIN A       (Enter YES or NO)
RANGE OF LEDS TEST SERIES?
>YES
ENTER THE MINIMUM NUMBER IN THE      (Enter the TSN)
RANGE
>01
ENTER THE MAXIMUM NUMBER IN THE
RANGE
>10
```

(If no particular data base is named, BIO-SEARCH will scan all entries in all four data bases. This is a lengthy sort and it is better to request each data base separately. When the data base is specified, the user may restrict the search to only a portion of the data base as shown. If a range is not requested by the user, the last two queries are skipped, and the entire data base is scanned.)

```
ENTER THE ADDITIONAL DATA BASE TO BE SELECTED/CORRECT A PREVIOUS
ENTRY/"END" OR CARRIAGE RETURN IF COMPLETE:

>END
```

(If a data base name is entered, the program will again ask if a range is requested and the ensuing steps are repeated. If END is entered, the program starts to execute. Typical output is as follows.)

```
BIOASSAY TEST TYPE:  CYTOTOXICITY

LEDS
-----
00001
00002
00003
00004
00005
00006
00007
00008
00009
00010

*** NORMAL END ***

>
```

At this point, the terminal is returned to the Control Mode; that is, the program has finished and the user may now enter additional commands.

The BIO-SEARCH program is very flexible and has a number of options available to users. This flexibility is best seen through the sample demand runs given in Section 7.4.9. Use of the "HELP" option is also shown there.

7.4.8 User Instructions -- Batch

The BIO-SEARCH program may also be executed as a batch job on the UNIVAC U-1100 using punched card input. It is assumed that the user has card input access to the U-1100 computer either through "across the counter" submitted at Research Triangle Park, NC, or through a remote batch terminal.

In order to run the BIO-SEARCH program in batch mode, the user should submit the following cards:

```
@RUN,R/RS Run ID,Account Number,EADS,5,50/50
@ASG,A EADS.
@XQT,BHZ EADS.BIO-SEARCH
. . . parameter cards . . .
@FIN
```

Three types of parameter cards are defined for BIO-SEARCH and they are used to drive the program. The Type 1 Parameter Card identifies the assay to be requested in terms of its test type or test name. The Type 2 Parameter Card identifies the data base to be selected and specifies the range of TSN's to be searched. The Type 3 Parameter Card is the END card which indicates to the program that the input data have been completed.

The formats for the parameter cards are as follows:

```
Type 1:        Card Col.     12345678...
                             A/TESTTYPE
                          or B/TESTNAME
```

where all data begin in column 1 of the card and:

A identifies the bioassay test type TESTTYPE; and
B identifies the bioassay test name TESTNAME.

```
                                      1         2
Type 2:        Card Col.     12345678901234567890
                             DBDBD MINXX-MAXZZ
```

where DBDBD identifies the data base name beginning in column 1 (choose FPEIS, GEDS, LEDS, or SDDS),

MINXX is the starting TSN in the range of TSN's to be specified. The TSN should be entered as a right-justified integer number in card columns 7-11,

- (enter a dash in card column 12)

MAXZZ is the last TSN in the range of TSN's to be specified. The TSN should be entered as a right-justified integer number in card columns 13-17.

Note If no range of TSN's is requested (that is, if the entire data base is to be searched), leave card columns 7-17 blank.

Also if one end of the TSN's range is entered, the other is required also. A Type 2 parameter card must be included for each data base requested. The order of the Type 2 cards is not important.

```
Type 3:        Card Col.     123
                             END
```

This card signifies the end of the data. It should be the last parameter card included in the card deck.

Caution The parameter cards must be entered into the card deck in the following order:

Type 1
All Type 2
Type 3

Sample print-outs from BIO-SEARCH are included in Section 7.4.10.

7.4.9 Sample Demand Runs

(1) Test Name Format:

```
>@ADD EADS.RUN/BIO-SEARCH
DO YOU NEED INSTRUCTIONS?
>NO

ENTER THE BIOASSAY TEST TYPE/NAME
>B/CHOV

BIOASSAY DATA NOT FOUND FOR:  B/CHOV
WOULD YOU LIKE TO TRY AGAIN?
>YES
ENTER THE BIOASSAY TEST TYPE/NAME
>B/CHO
DO YOU WISH A PARTICULAR DATA BASE?
>YES

ENTER THE DATA BASE TO BE SELECTED
>LEDS
```

card input access to the U-1100 computer either through "across the counter" submitted at Research Triangle Park, NC, or through a remote batch terminal.

In order to run the BIO-SEARCH program in batch mode, the user should submit the following cards:

```
@RUN,R/RS Run ID,Account Number,EADS,5,50/50
@ASG,A EADS.
@XQT,BHZ EADS.BIO-SEARCH
. . . parameter cards . . .
@FIN
```

Three types of parameter cards are defined for BIO-SEARCH and they are used to drive the program. The Type 1 Parameter Card identifies the assay to be requested in terms of its test type or test name. The Type 2 Parameter Card identifies the data base to be selected and specifies the range of TSN's to be searched. The Type 3 Parameter Card is the END card which indicates to the program that the input data have been completed.

The formats for the parameter cards are as follows:

```
Type 1:         Card Col,     12345678...
                              A/TESTTYPE
                          or  B/TESTNAME
```

where all data begin in column 1 of the card and:

A identifies the bioassay test type TESTTYPE; and
B identifies the bioassay test name TESTNAME.

```
                                        1         2
Type 2:         Card Col.     12345678901234567890
                              DBDBD MINXX-MAXZZ
```

where DBDBD identifies the data base name beginning in column 1 (choose FPEIS, GEDS, LEDS, or SDDS),

MINXX is the starting TSN in the range of TSN's to be specified. The TSN should be entered as a right-justified integer number in card columns 7-11,

- (enter a dash in card column 12)

MAXZZ is the last TSN in the range of TSN's to be specified. The TSN should be entered as a right-justified integer number in card columns 13-17.

Note If no range of TSN's is requested (that is, if the entire data base is to be searched), leave card columns 7-17 blank.

Also if one end of the TSN's range is entered, the other is required also. A Type 2 parameter card must be included for each data base requested. The order of the Type 2 cards is not important.

```
Type 3:        Card Col.     123
                             END
```

This card signifies the end of the data. It should be the last parameter card included in the card deck.

Caution The parameter cards _must_ be entered into the card deck in the following order:

Type 1
All Type 2
Type 3

Sample print-outs from BIO-SEARCH are included in Section 7.4.10.

7.4.9 Sample Demand Runs

(1) Test Name Format:

```
>@ADD EADS.RUN/BIO-SEARCH
DO YOU NEED INSTRUCTIONS?
>NO

ENTER THE BIOASSAY TEST TYPE/NAME
>B/CHOV

BIOASSAY DATA NOT FOUND FOR:  B/CHOV
WOULD YOU LIKE TO TRY AGAIN?
>YES
ENTER THE BIOASSAY TEST TYPE/NAME
>B/CHO
DO YOU WISH A PARTICULAR DATA BASE?
>YES

ENTER THE DATA BASE TO BE SELECTED
>LEDS
```

```
DO YOU WISH TO SELECT WITHIN A RANGE OF LEDS TEST SERIES?
>NO

ENTER THE ADDITIONAL DATA BASE TO BE SELECTED/CORRECT A
PREVIOUS ENTRY/"END" OR CARRIAGE RETURN IF COMPLETE:
>END

BIOASSAY TEST NAME:  CHO

LEDS
-----
00001
00002
00003
00004
00005
00006
00007
00008
00009
00010
00011
00143
00144
00145
00147
00148
00150
00151
00152
00153

*** NORMAL END ***

>
```

(2) Use of HELP Command:

```
>@ADD EADS.RUN/BIO-SEARCH

DO YOU NEED INSTRUCTIONS?
>NO
ENTER THE BIOASSAY TEST TYPE/NAME
>A/MUTAGENICITY
DO YOU WISH A PARTICULAR DATA BASE?
>HELP
"STOP" WILL EXIT PROGRAM
"A/TESTTYPE", "B/TESTNAME"
WILL SEARCH BY TEST TYPE OR NAME
"FPEIS", "GEDS", "LEDS", OR "SDDS" WILL SELECT A DATA BASE,
"END" MEANS END OF SOLICITATION FOR A DATA BASE.
>YES
```

```
ENTER THE DATA BASE TO BE SELECTED
>FPEIS
DO YOU WISH TO SELECT WITHIN A RANGE OF FPEIS TEST SERIES?
>YES
ENTER THE MINIMUM NUMBER IN THE RANGE
>1
ENTER THE MAXIMUM NUMBER IN THE RANGE
>5

ENTER THE ADDITIONAL DATA BASE TO BE SELECTED/CORRECT A
PREVIOUS ENTRY/"END" OR CARRIAGE RETURN IF COMPLETE:
>LEDS
DO YOU WISH TO SELECT WITHIN A RANGE OF LEDS TEST SERIES?
>YES
ENTER THE MINIMUM NUMBER IN THE RANGE
>5
ENTER THE MAXIMUM NUMBER IN THE RANGE
>10

ENTER THE ADDITIONAL DATA BASE TO BE SELECTED/CORRECT A
PREVIOUS ENTRY/"END" OR CARRIAGE RETURN IF COMPLETE:
>END

BIOASSAY TEST TYPE:  MUTAGENICITY

LEDS
-----
00005
00006
00007
00008
00009
00010

NO FPEIS SERIES FOUND BETWEEN SERIES 00001 AND 00005

*** NORMAL END ***

>
```

(3) Example of User Aborted Run:

```
>@ADD EADS.RUN/BIO-SEARCH

DO YOU NEED INSTRUCTIONS?
>NO
ENTER THE BIOASSAY TEST TYPE/NAME
>A/AMES

BIOASSAY DATA NOT FOUND FOR:  A/AMES
WOULD YOU LIKE TO TRY AGAIN:
>NO
```

(4) Invalid Data Format/Data Not Found:

```
>@ADD EADS.RUN/BIO-SEARCH

DO YOU NEED INSTRUCTIONS?
>NO
ENTER THE BIOASSAY TEST TYPE/NAME
>B/CYTOTOXICITY

BIOASSAY DATA NOT FOUND FOR:  B/CYTOTOXICITY
WOULD YOU LIKE TO TRY AGAIN?
>YES
ENTER THE CODE/CHEMICAL ID (FORMULA)
>A/CYTOTOXICITY

DO YOU WISH A PARTICULAR DATA BASE?
>YES
ENTER THE DATA BASE TO BE SELECTED
>LEDS
DO YOU WISH TO SELECT WITHIN A RANGE OF LEDS TEST SERIES?
>NO

ENTER THE ADDITIONAL DATA BASE TO BE SELECTED/CORRECT A
PREVIOUS ENTRY/"END" OR CARRIAGE RETURN IF COMPLETE:
>END

BIOASSAY TEST TYPE:  CYTOTOXICITY

NO LEDS SERIES FOUND IN ENTIRE DATA BASE

*** NORMAL END ***

>
```

7.4.10 Sample Batch Runs

The sample batch run outputs demonstrate the flexibility of the BIO-SEARCH program in satisfying user needs. The user input cards (which are listed in the output) are underlined.

(1) Use of Bioassay Test Name:

```
@RUN,D/RS Run ID,Account Number,EADS,10,20

@ASG,A EADS.

@XQT,BHZ EADS.BIO-SEARCH
ENTER THE BIOASSAY TEST TYPE/NAME
B/RAM
```

```
ENTER THE DATA BASE TO BE SELECTED
GEDS

ENTER THE DATA BASE TO BE SELECTED
LEDS   00001-00100

ENTER THE DATA BASE TO BE SELECTED
END

BIOASSAY TEST NAME:  RAM

LEDS
-----
00083
00089
00092
00093
00094
00095
00096

NO GEDS SERIES FOUND IN ENTIRE DATA BASE

*** NORMAL END ***

@FIN
```

7.5 RADIOLOGICAL SEARCH PROGRAM (RAD-SEARCH)

7.5.1 Applicability: FPEIS, GEDS, LEDS, SDDS

7.5.2 Abstract

The Radiological Search Program (RAD-SEARCH) enables the user to search all or part of the EADS waste stream data bases to determine the presence of a particular radionuclide. The user may identify the radionuclide by its chemical symbol and isotope (mass) number in the form XX-NNN. If a search is to be made of part of a data base, the data base name must be given and the range of TSN's must be specified. Both demand and batch versions of the program are available to the user. The demand version provides complete instructions on the use of the program through an interactive interface with the user. A "Help" command is also available to users who encounter problems.

For each data base scanned, the TSN is listed for those test series in which the radionuclide of interest is reported. The program does not report the concentration of the radionuclide species. The selection criteria require only that the radionuclide species be found once in a given test series even though multiple occurrences of the radionuclide may be present. It is recommended that the user request the SERIES Report for each test series identified in order to get more information.

7.5.3 User Data Required

- Valid Radionuclide Chemical Symbol and Isotope Number
- EADS Data Base Name (FPEIS, LEDS, GEDS, and/or SDDS)
- Range of TSN's (optional)

7.5.4 Data Qualification Required

None

7.5.5 Limitations/Restrictions

None

7.5.6 Functional Description

Using the user-supplied data on a particular radionuclide species, the RAD-SEARCH program scans all of the data bases specified to search for the radionuclide. If at least one occurrence of the species is found within a test series, that test series is listed in the output. If no data are found in the entire data base, this fact is also listed in the output.

7.5.7 User Instructions -- Demand

File name: EADS.RUN/RAD-SEARCH

The RAD-SEARCH program may be accessed through a "demand", or time-sharing, terminal (see Section 6.6), which can access the U-1100 computer. User access in demand mode enables the program to be run in "real time"; that is, the results are returned directly to the user.

The user shall initiate a demand session by following the procedures outlined in Section 6.6.1. When the session is completed, the session may be ended by following the procedures given in Section 6.6.2.

(In the following computer-generated instructions, the response by the user is underlined.)

```
>@ADD EADS.RUN/RAD-SEARCH            (Enter the file name)

DO YOU NEED INSTRUCTIONS?            (Enter YES or NO)
>YES

INSTRUCTIONS WILL BE LISTED SEVERAL LINES AT A TIME AND THEN STOP.  TO
CONTINUE DEPRESS CARRIAGE RETURN.

THIS PROGRAM WILL LIST TEST SERIES NUMBERS FROM THE EADS DATA BASE WHICH
HAVE USER SPECIFIED RADIONUCLIDES REPORTED IN THEIR ANALYSIS DATA.  THE
USER MUST IDENTIFY THIS RADIONUCLIDE TO THE PROGRAM BY USING THE CHEMICAL
SYMBOL AND ISOTOPE (MASS) NUMBER.

>(CR)
```

```
       THE FORMAT USED IS:  XX-NNN

WHERE XX = THE CHEMICAL SYMBOL
     NNN = THE ISOTOPE (MASS) NUMBER

>(CR)

THE USER HAS THE OPTION OF SPECIFYING WHICH DATA BASE SERIES ARE TO BE
LISTED (FPEIS, GEDS, LEDS, OR SDDS).  ADDITIONALLY, THE USER MAY LIMIT THE
LIST TO SPECIFIC RANGES, ONE PER DATA BASE.

TO SPECIFY A RANGE FOR ANY DB, THE USER MUST SELECT A "PARTICULAR" DATA
BASE WHEN QUERIED.  "STOP" AND "HELP" MAY BE ENTERED AT ANY TIME.  "STOP"
WILL EXIT THE PROGRAM.  "HELP" WILL BRIEFLY LIST THE MAJOR QUERY RESPONSE
FORMATS.  (IMPORTANT - ANY QUERY LISTED PRIOR TO A "HELP" REQUEST WILL NOT
BE SHOWN AGAIN AFTER THE HELP RESPONSE FROM THE PROGRAM.)

>(CR)
```

(If the reply to the above question is NO, the preceding statements are skipped.)

```
ENTER THE RADIONUCLIDE ID            (Use the format described above)

>RN-220

DO YOU WISH A PARTICULAR DATA BASE?  (Enter YES or NO)
>YES
ENTER THE DATA BASE TO BE SELECTED   (Enter LEDS, GEDS, SDDS, or FPEIS)
>GEDS
DO YOU WISH TO SELECT WITHIN A       (Enter YES or NO)
RANGE OF GEDS TEST SERIES?
>YES
ENTER THE MINIMUM NUMBER IN THE      (Enter the TSN)
RANGE
>01
ENTER THE MAXIMUM NUMBER IN THE
RANGE
>10
```

(If no particular data base is named, RAD-SEARCH will scan all entries in all four data bases. This is a lengthy sort and it is better to request each data base separately. When the data base is specified, the user may restrict the search to only a portion of the data base as shown. If a range is not requested, by the user, the last two queries are skipped, and the entire data base is scanned.)

```
ENTER THE ADDITIONAL DATA BASE TO BE SELECTED/CORRECT A PREVIOUS
ENTRY/"END" OR CARRIAGE RETURN IF COMPLETE:

>END
```

(If a data base name is entered, the program will again ask if a range is requested and the ensuing steps are repeated. If END is entered, the program starts to execute. Typical output is as follows.)

```
RADIONUCLIDE:  RN-220

GEDS
-----
00001
00002
00003
00004
00005
00006
00007
00008
00009
00010

*** NORMAL END ***

>
```

At this point, the terminal is returned to the Control Mode; that is, the program has finished and the user may now enter additional commands.

The RAD-SEARCH program is very flexible and this flexibility is best seen through the sample demand runs given in Section 7.5.9. Use of the "HELP" option is also shown there.

7.5.8 User Instructions -- Batch

The RAD-SEARCH program may also be executed as a batch job on the UNIVAC U-1100 using punched card input. It is assumed that the user has card input access to the U-1100 computer either through "across the counter" submitted at Research Triangle Park, NC, or through a remote batch terminal.

In order to run the RAD-SEARCH program in batch mode, the user should submit the following cards:

```
@RUN,R/RS Run ID,Account Number, EADS,5,50/50
@ASG,A EADS.
@XQT,BHZ EADS.RAD-SEARCH
. . . parameter cards . . .
@FIN
```

Three types of parameter cards are defined for RAD-SEARCH and they are used to drive the program. The Type 1 Parameter Card identifies the radionuclide to be requested in terms of its chemical symbol and isotope (mass) number. The Type 2 Parameter Card identifies the data base to be selected and specifies the range of TSN's to be searched. The Type 3 Parameter Card is the END card which indicates to the program that the input data have been completed.

The formats for the parameter cards are as follows:

```
Type 1:        Card Col.     12345678
                             XX-NNN
```

where all data begin in column 1 of the card and:

XX = the chemical symbol, and
NNN = the isotope (mass) number.

```
                                       1         2
Type 2:        Card Col.     12345678901234567890
                             DBDBD MINXX-MAXZZ
```

where DBDBD identifies the data base name beginning in column 1 (choose FPEIS, GEDS, LEDS, or SDDS),

MINXX is the starting TSN in the range of TSN's to be specified. The TSN should be entered as a right-justified integer number in card columns 7-11,

- (enter a dash in card column 12)

MAXZZ is the last TSN in the range of TSN's to be specified. The TSN should be entered as a right-justified integer number in card columns 13-17.

Note If no range of TSN's is requested (that is, if the entire data base is to be searched), leave card columns 7-17 blank.

Also, if one end of the TSN range is entered, the other is required also. A Type 2 parameter card must be included for each data base requested. The order of the Type 2 cards is not important.

```
Type 3:        Card Col.     123
                             END
```

This card signifies the end of the data. It should be the last parameter card included in the card deck.

Caution The parameter cards must be entered into the card deck in the following order:

Type 1
All Type 2
Type 3

Sample print-outs from RAD-SEARCH are included in Section 7.2.10.

7.5.9 Sample Demand Runs

(1) Radionuclide with Full Data Base Scan:

```
>@ADD EADS.RUN/RAD-SEARCH
DO YOU NEED INSTRUCTIONS?
>NO

ENTER THE RADIONUCLIDE ID
>I-131

DO YOU WISH A PARTICULAR DATA BASE?
>YES

ENTER THE DATA BASE TO BE SELECTED
>LEDS
DO YOU WISH TO SELECT WITHIN A RANGE OF LEDS TEST SERIES?
>NO

ENTER THE ADDITIONAL DATA BASE TO BE SELECTED/CORRECT A
PREVIOUS ENTRY/"END" OR CARRIAGE RETURN IF COMPLETE:
>FPEIS
DO YOU WISH TO SELECT WITHIN A RANGE OF FPEIS TEST SERIES?
>NO

ENTER THE ADDITIONAL DATA BASE TO BE SELECTED/CORRECT A
PREVIOUS ENTRY/"END" OR CARRIAGE RETURN IF COMPLETE:
>END
```

```
RADIONUCLIDE:  I-131

LEDS
-----
00001
00002
00003
00004
00005

NO FPEIS SERIES FOUND IN ENTIRE DATA BASE

*** NORMAL END ***

>
```

(2) Use of HELP Command:

```
>@ADD EADS.RUN/RAD-SEARCH

DO YOU NEED INSTRUCTIONS?
>NO
ENTER THE RADIONUCLIDE ID
>U-238
DO YOU WISH A PARTICULAR DATA BASE?
>HELP
"STOP" WILL EXIT PROGRAM
XX-NNN FOR RADIONUCLIDE FORMAT WILL SEARCH BY RADIONUCLIDE
"FPEIS", "GEDS", "LEDS" OR "SDDS" WILL SELECT A DATA BASE,
"END" MEANS END OF SOLICITATION FOR A DATA BASE.
>YES

ENTER THE DATA BASE TO BE SELECTED
>FPEIS
DO YOU WISH TO SELECT WITHIN A RANGE OF FPEIS TEST SERIES?
>YES
ENTER THE MINIMUM NUMBER IN THE RANGE
>1
ENTER THE MAXIMUM NUMBER IN THE RANGE
>5

ENTER THE ADDITIONAL DATA BASE TO BE SELECTED/CORRECT A
PREVIOUS ENTRY/"END" OR CARRIAGE RETURN IF COMPLETE:
>LEDS
DO YOU WISH TO SELECT WITHIN A RANGE OF LEDS TEST SERIES?
>YES
ENTER THE MINIMUM NUMBER IN THE RANGE
>5
ENTER THE MAXIMUM NUMBER IN THE RANGE
>10

ENTER THE ADDITIONAL DATA BASE TO BE SELECTED/CORRECT A
PREVIOUS ENTRY/"END" OR CARRIAGE RETURN IF COMPLETE:
```

```
>END

RADIONUCLIDE:  U-238

LEDS
-----
00005
00006
00007
00008
00009
00010

NO FPEIS SERIES FOUND BETWEEN SERIES 00001 AND 00005

*** NORMAL END ***

>
```

(3) Example of User Aborted Run:

```
>@ADD EADS.RUN/RAD-SEARCH

DO YOU NEED INSTRUCTIONS?
>NO
ENTER THE RADIONUCLIDE ID (FORMULA)
>KR-85M

DO YOU WISH A PARTICULAR DATA BASE?
>STOP
```

7.5.10 Sample Batch Runs

The sample batch run outputs demonstrate the flexibility of the RAD-SEARCH program in satisfying user needs. The user input cards (which are listed in the output) are underlined.

(1) Multiple Data Base Selection:

```
@RUN,D/RS Run ID,Account Number, EADS,10,20

@ASG,A EADS.

@XQT,BHZ EADS.RAD-SEARCH
ENTER THE RADIONUCLIDE ID
KR-85

ENTER THE DATA BASE TO BE SELECTED
GEDS
```

```
ENTER THE DATA BASE TO BE SELECTED
LEDS   00001-00100

ENTER THE DATA BASE TO BE SELECTED
END

RADIONUCLIDE:  KR-85

LEDS
-----
00083
00089
00092
00093
00094
00095
00096

NO GEDS SERIES FOUND IN ENTIRE DATA BASE

*** NORMAL END ***

@FIN
```

7.6 CONTROL TECHNOLOGY SEARCH PROGRAM (CONTROL-SEARCH)

7.6.1 Applicability: FPEIS, GEDS, LEDS, SDDS

7.6.2 Abstract

The Control Technology Search Program (CONTROL-SEARCH) enables the user to search all or part of the EADS waste stream data bases to determine the presence of a particular control technology. The user may identify the control technology by specifying either the generic device type or the design type as given in Table A-4 of the EADS Terminology Reference Manual. If a search is to be made of part of a data base, the data base name must be given and the range of TSN's must be specified. Both demand and batch versions of the program are available to the user. The demand version provides complete instructions on the use of the program through an interactive interface with the user. A "Help" command is also available to users who encounter problems.

For each data base scanned, the TSN is listed for those test series in which the control technology of interest is reported. The selection criteria require only that the control technology generic type or design type be found once in a given test series. It is recommended that the user request the SERIES Report for each test series identified in order to get more information.

7.6.3 User Data Required

- Valid Control Technology Generic Device Type or Design Type
- EADS Data Base Name (FPEIS, LEDS, GEDS, and/or SDDS)
- Range of TSN's (optional)

7.6.4 Data Qualification Required

None

7.6.5 Limitations/Restrictions

The user is cautioned to use care when selecting the Design Type option for control technology. Since several generic control system types have the same or similar design types, it would likely be safer to search on the basis of the generic type only, or thoroughly check the Terminology Reference Manual to be certain of the correct Design Type value.

7.6.6 Functional Description

Using the user-supplied data on a particular control technology, the CONTROL-SEARCH program initially checks to verify that a valid Generic Device Type or Design Type has been requested. The program next scans all of the data bases specified. If at least one occurrence of the generic type or design type is found within a test series, that test series is listed in the output. If no data are found in the entire data base, this fact is also listed in the output.

7.6.7 User Instructions -- Demand   File name: EADS.RUN/CONTROL-SEARCH

The CONTROL-SEARCH program may be accessed through a "demand", or time-sharing, terminal (see Section 6.6), which can access the U-1100 computer. User access in demand mode enables the program to be run in "real time"; that is, the results are returned directly to the user.

The user shall initiate a demand session by following the procedures outlined in Section 6.6.1. When the session is completed, the session may be ended by the following the procedures given in Section 6.6.2.

(In the following computer-generated instructions, the response by the user is underlined.)

```
>@ADD EADS.RUN/CONTROL-SEARCH                    (Enter the file name)

DO YOU NEED INSTRUCTIONS?                        (Enter YES or NO)
>YES
```

```
INSTRUCTIONS WILL BE LISTED SEVERAL LINES AT A TIME AND THEN STOP.  TO
CONTINUE DEPRESS CARRIAGE RETURN.

THIS PROGRAM WILL LIST TEST SERIES NUMBERS FROM THE EADS DATA BASE WHICH
HAVE USER SPECIFIED CONTROL TECHNOLOGY REPORTED IN THEIR ANALYSIS DATA.
THE USER MUST IDENTIFY THIS CONTROL TECHNOLOGY TO THE PROGRAM BY USING THE
GENERIC DEVICE TYPE OR DESIGN TYPE.

>(CR)

THE FORMAT USED IS:

       G/GENERICTYPE                 FOR THE GENERIC TYPE -- OR --
       D/DESIGNTYPE                  FOR THE DESIGN TYPE.

>(CR)

THE USER HAS THE OPTION OF SPECIFYING WHICH DATA BASE SERIES ARE TO BE
LISTED (FPEIS, GEDS, LEDS, OR SDDS).  ADDITIONALLY, THE USER MAY LIMIT THE
LIST TO SPECIFIC RANGES, ONE PER DATA BASE.  TO SPECIFY A RANGE FOR ANY
DB, THE USER MUST SELECT A "PARTICULAR" DATA BASE WHEN QUERIED.  "STOP"
AND "HELP" MAY BE ENTERED AT ANY TIME.  "STOP" WILL EXIT THE PROGRAM.
"HELP" WILL BRIEFLY LIST THE MAJOR QUERY RESPONSE FORMATS.  (IMPORTANT -
ANY QUERY LISTED PRIOR TO A "HELP" REQUEST WILL NOT BE SHOWN AGAIN AFTER
THE HELP RESPONSE FROM THE PROGRAM.)

>(CR)
```

(If the reply to the above question is NO, the preceding statements are skipped.)

```
ENTER THE GENERIC/DESIGN TYPE        (Use the format described above)

>G/BIOLOGICAL PROCESSES
DO YOU WISH A PARTICULAR DATA BASE?  (Enter YES or NO)
>YES

ENTER THE DATA BASE TO BE SELECTED   (Enter LEDS, GEDS, SDDS, or FPEIS)
>LEDS
DO YOU WISH TO SELECT WITHIN A       (Enter YES or NO)
RANGE OF LEDS TEST SERIES?
>YES

ENTER THE MINIMUM NUMBER IN THE      (Enter the TSN)
RANGE
>01
ENTER THE MAXIMUM NUMBER IN THE
RANGE
>10
```

(If no particular data base is named, CONTROL-SEARCH will scan all entries in all four data bases. This is a lengthy sort and it is better to request each data base separately. When the data base is specified, the user may restrict the search to only a portion of the data base as shown. If a range is not requested by the user, the last two queries are skipped, and the entire data base is scanned.)

```
ENTER THE ADDITIONAL DATA BASE TO BE SELECTED/CORRECT A PREVIOUS
ENTRY/"END" OR CARRIAGE RETURN IF COMPLETE:

>END
```

(If a data base name is entered, the program will again ask if a range is requested and the ensuing steps are repeated. If END is entered, the program starts to execute. Typical output is as follows.)

```
CONTROL TECHNOLOGY GENERIC TYPE:  BIOLOGICAL PROCESSES

LEDS
-----
00001
00002
00003
00004
00005
00006
00007
00008
00009
00010

*** NORMAL END ***

>
```

At this point, the terminal is returned to the Control Mode; that is, the program has finished and the user may now enter additional commands.

The CONTROL-SEARCH program is very flexible and has a number of options available to users. This flexibility is best seen through the sample demand runs given in Section 7.6.9. Use of the "HELP" option is also shown there.

7.6.8 User Instructions -- Batch

The CONTROL-SEARCH program may also be executed as a batch job on the UNIVAC U-1100 using punched card input. It is assumed that the user has card input access to the U-1100 computer either through "across the counter" submitted at Research Triangle Park, NC, or through a remote batch terminal.

In order to run the CONTROL-SEARCH program in batch mode, the user should submit the following cards:

```
@RUN/RS Run ID,Account Number,EADS,5,50/50
@ASG,A EADS.
@XQT,BHZ EADS.CONTROL-SEARCH
. . . parameter cards . . .
@FIN
```

Three types of parameter cards are defined for CONTROL-SEARCH and they are used to drive the program. The Type 1 Parameter Card identifies the control technology to be requested in terms of its generic type or design type. The Type 2 Parameter Card identifies the data base to be selected and specifies the range of TSN's to be searched. The Type 3 Parameter Card is the END card which indicates to the program that the input data have been completed.

The formats for the parameter cards are as follows:

```
                                  1         2         3
Type 1:      Card Col.   123456789012345678901234567890123456
                         G/AAAAAAAA..........AA
                  or     D/BBBBBBBBBB......................BB
```

where all data begin in column 1 of the card and:

G identifies the Generic Type AAAA....; and
D identifies the Design Type BBBB.....

```
                                  1         2
Type 2:      Card Col.   12345678901234567890
                         DBDBD MINXX-MAXZZ
```

where DBDBD identifies the data base name beginning in column 1 (choose FPEIS, GEDS, LEDS, or SDDS),

MINXX is the starting TSN in the range of TSN's to be specified. The TSN should be entered as a right-justified integer number in card columns 7-11,

- (enter a dash in card column 12)

MAXZZ is the last TSN in the range of TSN's to be specified. The TSN should be entered as a right-justified integer number in card columns 13-17.

Note If no range of TSN's is requested (that is, if the entire data base is to be searched), leave card columns 7-17 blank.

Also, if one end of the TSN range is entered, the other is required also. A Type 2 parameter card must be included for each data base requested. The order of the Type 2 cards is not important.

```
Type 3:        Card Col.     123
                             END
```

This card signifies the end of the data. It should be the last parameter card included in the card deck.

Caution The parameter cards <u>must</u> be entered into the card deck in the following order:

Type 1
All Type 2
Type 3

Sample print-outs from CONTROL-SEARCH are included in Section 7.6.10.

7.6.9 <u>Sample Demand Runs</u>

(1) Device Type Format:

```
>@ADD EADS.RUN/CONTROL-SEARCH
DO YOU NEED INSTRUCTIONS?
>NO

ENTER THE GENERIC/DESIGN TYPE
>D/ACTIVATED SLUGE

CONTROL DATA NOT FOUND FOR:  D/ACTIVATED SLUGE
WOULD YOU LIKE TO TRY AGAIN?
>YES
```

```
ENTER THE GENERIC/DESIGN TYPE
>D/ACTIVATED SLUDGE
DO YOU WISH A PARTICULAR DATA BASE?
>YES

ENTER THE DATA BASE TO BE SELECTED
>LEDS
DO YOU WISH TO SELECT WITHIN A RANGE OF LEDS TEST SERIES?
>NO

ENTER THE ADDITIONAL DATA BASE TO BE SELECTED/CORRECT A
PREVIOUS ENTRY/"END" OR CARRIAGE RETURN IF COMPLETE:
>END

CONTROL TECHNOLOGY DESIGN TYPE:  ACTIVATED SLUDGE

LEDS
-----
00001
00002
00003
00004
00005
00006
00007
00008
00009
00010
00011
00143
00144
00145
00147
00148
00150
00151
00152
00153

*** NORMAL END ***

>
```

(2) Use of HELP Command:

```
>@ADD EADS.RUN/CONTROL-SEARCH
DO YOU NEED INSTRUCTIONS?
>NO

ENTER THE GENERIC/DESIGN TYPE
>G/ESP
DO YOU WISH A PARTICULAR DATA BASE?
>HELP
```

```
"STOP" WILL EXIT PROGRAM
"G/AAA...", "D/BBB..."
WILL SEARCH BY GENERIC/DEVICE TYPE,
"FPEIS", "GEDS", "LEDS" OR "SDDS" WILL SELECT A DATA BASE,
"END" MEANS END OF SOLICITATION FOR A DATA BASE.
>YES

ENTER THE DATA BASE TO BE SELECTED
>FPEIS
DO YOU WISH TO SELECT WITHIN A RANGE OF FPEIS TEST SERIES?
>YES
ENTER THE MINIMUM NUMBER IN THE RANGE
>1
ENTER THE MAXIMUM NUMBER IN THE RANGE
>5

ENTER THE ADDITIONAL DATA BASE TO BE SELECTED/CORRECT A
PREVIOUS ENTRY/"END" OR CARRIAGE RETURN IF COMPLETE:
>GEDS
DO YOU WISH TO SELECT WITHIN A RANGE OF GEDS TEST SERIES?
>YES
ENTER THE MINIMUM NUMBER IN THE RANGE
>5
ENTER THE MAXIMUM NUMBER IN THE RANGE
>10

ENTER THE ADDITIONAL DATA BASE TO BE SELECTED/CORRECT A
PREVIOUS ENTRY/"END" OR CARRIAGE RETURN IF COMPLETE:
>END

CONTROL TECHNOLOGY GENERIC TYPE:  ESP

FPEIS
-----
00005
00006
00007
00008
00009
00010

NO GEDS SERIES FOUND BETWEEN SERIES 00001 AND 00005

*** NORMAL END ***

>
```

(3) Example of User Aborted Run:

```
>@ADD EADS.RUN/CONTROL-SEARCH
DO YOU NEED INSTRUCTIONS?
>NO
```

```
ENTER THE GENERIC/DESIGN TYPE
>D/MULTICLONE

CONTROL DATA NOT FOUND FOR:  D/MULTICLONE
WOULD YOU LIKE TO TRY AGAIN?
>NO
```

(4) Invalid Data Format/Data Not Found:

```
>@ADD EADS.RUN/CONTROL-SEARCH
DO YOU NEED INSTRUCTIONS?
>NO

ENTER THE GENERIC/DESIGN TYPE
>C/ESP
INVALID FORMAT (C/ESP)

CONTROL DATA NOT FOUND FOR:  C/ESP
WOULD YOU LIKE TO TRY AGAIN?
>YES
ENTER THE GENERIC/DESIGN TYPE
>G/ESPS

CONTROL DATA NOT FOUND FOR:  G/ESPS
WOULD YOU LIKE TO TRY AGAIN?
>YES
ENTER THE GENERIC/DESIGN TYPE
>G/ESP
DO YOU WISH A PARTICULAR DATA BASE?
>YES

ENTER THE DATA BASE TO BE SELECTED
>GEDS
DO YOU WISH TO SELECT WITHIN A RANGE OF GEDS TEST SERIES?
>NO

ENTER THE ADDITIONAL DATA BASE TO BE SELECTED/CORRECT A
PREVIOUS ENTRY/"END" OR CARRIAGE RETURN IF COMPLETE:
>END

CONTROL TECHNOLOGY GENERIC TYPE:  ESP

NO GEDS SERIES FOUND IN ENTIRE DATA BASE

*** NORMAL END ***

>
```

7.6.10 Sample Batch Runs

The sample batch run outputs demonstrate the flexibility of the CONTROL-SEARCH program in satisfying user needs. The user input cards (which are listed in the output) are underlined.

(1) Design Type Format:

```
@RUN,D/RS Run ID,Account Number,EADS,10,20
@ASG,A EADS.
@XQT,BHZ EADS.CONTROL-SEARCH
ENTER THE GENERIC/DESIGN TYPE
D/ACTIVATED CARBON

ENTER THE DATA BASE TO BE SELECTED
SDDS

ENTER THE DATA BASE TO BE SELECTED
LEDS   00001-00100

ENTER THE DATA BASE TO BE SELECTED
END

LEDS
-----
00083
00089
00092
00093
00094
00095
00096

NO SDDS SERIES FOUND IN ENTIRE DATA BASE

*** NORMAL END ***

@FIN
```

APPENDIX A.1

LIST OF ERROR MESSAGES

```
TERM-012                                 EADS                                  PAGE       1
                                      ERROR  LIST                              DATE 05/12/80

CODE  DATA BASE  TYPE  COMPONENT  MESSAGE
----  ---------  ----  ---------  ------------------------------------------------------------
   1     ALL       F      C110    MISSING SOURCE CATEGORY
   2     ALL       F      C120    MISSING SOURCE TYPE
   3     ALL       F      C125    MISSING PRODUCT/DEVICE TYPE
   4     ALL       F      C270    NON-NUMERIC SIC CODE
   5     ALL       F      C130    MISSING PROCESS RATE
   6     ALL       F      C140    NON-NUMERIC DESIGN PROCESS RATE
   7     ALL       F      C145    MISSING PROCESS RATE UNITS
   8     ALL       F      C150    MISSING FEED MATERIAL CATEGORY
   9     ALL       F      C230    NON-NUMERIC ZIP CODE
  10     ALL       F      C235    NON-NUMERIC FPEIS TSN
  11     ALL       F      C240    NON-NUMERIC SDDS TSN
  12     ALL       F      C250    NON-NUMERIC GEDS TSN
  13     ALL       F      C260    NON-NUMERIC LEDS TSN
  14     ALL       F      C300    NON-NUMERIC NPDES NUMBER
  15     ALL       F      C340    INVALID START DATE
  16     ALL       F      C350    INVALID FINISH DATE
  17     ALL       F      C155    MISSING SPONSOR ORGANIZATION
  18     ALL       F      C160    MISSING CONTRACT NUMBER
  19     ALL       F      C170    NON-NUMERIC TO/TD NUMBER
  20     ALL       F      C330    MISSING NAME OF SAMPLING GROUP
  21     ALL       F      C361    NON-NUMERIC COMMENT LINE NUMBER
  22     ALL       F      C410    NON-NUMERIC STREAM NUMBER
  23     ALL       F      C430    NON-NUMERIC FLOWRATE
  24     ALL       F      C440    NON-NUMERIC VELOCITY
  25     ALL       F      C450    NON-NUMERIC TEMPERATURE
  26     ALL       F      C460    NON-NUMERIC PRESSURE
  27     ALL       F      C470    NON-NUMERIC MOISTURE CONTENT
  28     ALL       F      C475    NON-NUMERIC STACK HEIGHT
  36     ALL       F      C505    NON-NUMERIC/MUST BE 01,02,03,04,OR 05
  37     ALL       F      C505    DEVICE NUMBER MISSING OFF OF DO CARD
  38     ALL       F      C585    NON-NUMERIC SEQ NO OR GREATER THAN 14
  39     ALL       F      C610    NON-NUMERIC PARAMETER NO.
  40     ALL       F      C810    NON-NUMERIC TEST ID NO
  41     ALL       F      C820    INVALID TEST DATE
  42     ALL       F      C830    NON-NUMERIC START TIME
  43     ALL       F      C840    NON-NUMERIC END TIME
  44     ALL       F      C860    NON-NUMERIC DESIGN CAPACITY
  45     ALL       F      C1010   NON-NUMERIC DEVICE/PROCESS NUMBER
  46     ALL       F      C1010   NO MATCH WITH DEVICE SET UP ON DO CARD
  47     ALL       F      C1010   DEVICE/PROCESS NUMBER MISSING OFF E1
  48     ALL       F      C1060   NON-NUMERIC/ONLY 30 PARAMETERS PER DEVICE
  49     ALL       F      C874    NON-NUMERIC FEED MATERIAL SAMPLE MASS
  50     ALL       F      C876    NON-NUMERIC FEED MATERIAL SAMPLE VOLUME
  51     ALL       F      C930    INVALID VALUE TYPE NOT T OR N
  52     ALL       F      C931    NON-NUMERIC PARAMETER VALUE
  53     ALL       F      C955    NON-NUMERIC TOTAL MG RECOVERED__
  54     ALL       F      C955    NON-NUMERIC TOTAL MG RECOVERED__
  55     ALL       F      C960    INVALID ACTUAL SOURCE SYMBOL
  56     ALL       F      C965    NON-NUMERIC ACTUAL CONCENTRATION MANTISSA
```

```
TERM-012                                  EADS                                            PAGE       2
                                       ERROR  LIST                                        DATE 05/12/80

CODE  DATA BASE  TYPE  COMPONENT  MESSAGE
----  ---------  ----  ---------  ---------------------------------------------------------------
  57     ALL       F      C967    NON-NUMERIC ACTUAL CONCENTRATION EXPONENT
  58     ALL       F     C1203    NON-NUMERIC SAMPLE NUMBER
  59     ALL       F     C1206    NON-NUMERIC METHOD TYPE
  60     ALL       F     C1212    NON-NUMERIC/LESS THAN ZERO SAMPLE START TIME
  61     ALL       F     C1215    NON-NUMERIC/LESS THAN ZERO SAMPLE DURATION
  62     ALL       F     C1224    NON-NUMERIC SAMPLE VELOCITY
  63     ALL       F     C1227    NON-NUMERIC SAMPLE TEMPERATURE
  64     ALL       F     C1230    NON-NUMERIC SAMPLE PRESSURE
  65     ALL       F     C1233    NON-NUMERIC MOISTURE CONTENT
  66     ALL       F     C1236    NON-NUMERIC DENSITY
  67     ALL       F     C1239    NON-NUMERIC DENSITY DETERMINATION
  68     ALL       F     C1248    NON-NUMERIC VOLUME
  69     ALL       F     C1218    NON-NUMERIC FLOWRATE
  70     ALL       F     C1251    NON-NUMERIC TOTAL MASS
  71     ALL       F     C1245    INVALID CODE NOT O OR I
  72     ALL       F     C1243    NON-NUMERIC INSTRUMENT TEMPERATURE
  73     ALL       F     C1244    NON-NUMERIC INSTRUMENT PRESSURE
  74     ALL       F     C1246    NON-NUMERIC INSTRUMENT FLOWRATE
  75     ALL       F     C1257    NON-NUMERIC % ISOKINETIC
  76     ALL       F     C1260    NON-NUMERIC CO2
  77     ALL       F     C1262    NON-NUMERIC CO
  78     ALL       F     C1264    NON-NUMERIC O2
  79     ALL       F     C1266    NON-NUMERIC N2
  80     ALL       F     C1270    NON-NUMERIC DILUTION FACTOR
  81     ALL       F     C1276    NON-NUMERIC PARTICLE DIAMETER BASIS
  82     ALL       F     C1278    NON-NUMERIC PARTICLE CONCENTRATION BASIS
  83     ALL       F     C1280    NON-NUMERIC UPPER BOUNDARY DIAMETER
  84     ALL       F     C1282    NON-NUMERIC CALIBRATION/CALCULATION
  85     ALL       F     C1303    NON-NUMERIC COMPONENT SEQ NO.
  86     ALL       F     C1313    NON-NUMERIC CONCENTRATION MANTISSA
  87     ALL       F     C1316    NON-NUMERIC CONCENTRATION EXPONENT
  88     ALL       F     C1303    INVALID COMPONENT SEQUENCE NUMBER MATCH
  89     ALL       F     C1330    NON-NUMERIC COMPONENT (ALIQUOT) MASS/VOLUME
  90     ALL       F              NO SPACE IN EFFLUENT CHARACTERISTICS TABLE
  91     ALL       F     C1429    INVALID VALUE TYPE NOT T OR N
  92     ALL       F     C1430    NON-NUMERIC EFFLUENT CHARACTERISTICS VALUE
  93     ALL       F     C1847    INVALID TOTAL MILLIGRAMS SYMBOL
  94     ALL       F     C1850    NON-NUMERIC TOTAL MG RECOVERED MANTISSA
  95     ALL       F     C1852    NON-NUMERIC TOTAL MG RECOVERED EXPONENT
  96     ALL       F     C2540    NON-NUMERIC TCO
  97     ALL       F     C2540    NON-NUMERIC TCO
  98     ALL       F     C2550    NON-NUMERIC GRAV.
  99     ALL       F     C2550    NON-NUMERIC GRAV.
 100     ALL       F              TCO COUNT GREATER THAN 7 FORM 9
 101     ALL       F     C2590    NON-NUMERIC INTENSITY
 102     ALL       F     C2595    INVALID ACTUAL SOURCE SYMBOL
 103     ALL       F     C2600    NON-NUMERIC ACTUAL SOURCE CONCENTRATION MANTISSA
 104     ALL       F     C2605    NON-NUMERIC ACTUAL SOURCE CONCENTRATION EXPONENT
 105     ALL       F     C3034    INVALID ACTUAL CONCENTRATION SYMBOL
```

```
TERM-012                                  EADS                                         PAGE       3
                                       ERROR  LIST                                     DATE 05/12/80

CODE  DATA BASE  TYPE  COMPONENT  MESSAGE
----  ---------  ----  ---------  ------------------------------------------------------------
 106     ALL       F     C3035    NON-NUMERIC ACTUAL SOURCE CONCENTRATION MANTISSA
 107     ALL       F     C3040    NON-NUMERIC ACTUAL SOURCE CONCENTRATION EXPONENT
 108     ALL       F     C3215    NON-NUMERIC TEST DURATION
 109     ALL       F     C3220    NON-NUMERIC SAMPLE NUMBER
 110     ALL       F     C3230    INVALID TEST START DATE
 111     ALL       F     C3235    INVALID TEST FINISH DATE
 112     ALL       F     C3240    NON-NUMERIC SAMPLE QUANTITY
 113     ALL       F     C3285    NON-NUMERIC VALUE MANTISSA
 114     ALL       F     C3286    NON-NUMERIC VALUE EXPONENT
 115     ALL       F     C3295    NON-NUMERIC HIGH CONFIDENCE VALUE MANTISSA
 116     ALL       F     C3296    NON-NUMERIC HIGH CONFIDENCE VALUE EXPONENT
 117     ALL       F     C3305    NON-NUMERIC MAXIUM APPLICABLE DOSE MANTISSA
 118     ALL       F     C3306    NON-NUMERIC MAXIUM APPLICABLE DOSE EXPONENT
 119     ALL       F     C3325    NON-NUMERIC MINIMUN EFFECTIVE CONCENTRATION MANTISSA
 120     ALL       F     C3326    NON-NUMERIC MINIMUN EFFECTIVE CONCENTRATION EXPONENT
 121     ALL       F     C3365    NON-NUMERIC LINE NO.
 122     ALL       F              INVALID SOURCE CATEGORY TABLE MATCH
 123     ALL       F              INVALID FEED MATERIAL CATEGORY TABLE MATCH
 124     ALL       F              INVALID CONTROL SYSTEM TABLE MATCH
 125     ALL       F              INVALID DEVICE/PROCESS CLASS TABLE MATCH
 126     ALL       F              INVALID DEVICE/PROCESS KEYWORD TABLE MATCH
 127     ALL       F     C926     INVALID ANALYTICAL CODE TABLE MATCH
 128     ALL       F     C946     INVALID CHEMICAL ID TYPE(NOT S,C,M)
 129     ALL       F     C945     INVALID CHEMICAL CATEGORY/SPECIES
 130     ALL       F     C3851    INVALID RETURN CODE (CALL PROGRAMMER)
 131     ALL       F     C3851    INVALID RETURN CODE (CALL PROGRAMMER)
 132     ALL       F     C950     INVALID ANALYTICAL CODE TABLE MATCH
 133     ALL       F     C1425    INVALID ANALYTICAL CODE
 134     ALL       F     C1425    INVALID ANALYTICAL CODE TABLE MATCH
 135     ALL       F     C3830    INVALID CHEMICAL ID TYPE(NOT S,C,M)
 136     ALL       F     C5835    INVALID CHEMICAL CATEGORY/SPECIES
 137     ALL       F     C3851    INVALID RETURN CODE (CALL PROGRAMMER)
 138     ALL       F     C3851    INVALID RETURN CODE (CALL PROGRAMMER)
 139     ALL       F     C3840    INVALID ANALYTICAL CODE TABLE MATCH
 140     ALL       F     C2582    INVALID CHEMICAL ID TYPE(NOT S,C,M)
 141     ALL       F     C2585    INVALID CHEMICAL CATEGORY/SPECIES
 142     ALL       F     C2585    INVALID ANALYTICAL CODE TABLE MATCH
 143     ALL       F     C3030    INVALID ANALYTICAL CODE TABLE MATCH
 144     ALL       F     C3210    INVALID BIO-TEST NAME TABLE MATCH
 145     ALL       F     C3205    INVALID BIO-TEST TYPE TABLE MATCH
 146     ALL       F              NON-NUMERIC TEST SERIES NUMBER
 147     ALL       F              INVALID DATA BASE TYPE (NOT F,G,L,S)
 148     ALL       F              MISSING CARD ID
 149     ALL       F              INVALID CARD NUMBER
 150     ALL       F     C3300    NON-NUMERIC LOW CONFIDENCE LIMIT MANTISSA
 151     ALL       F     C3301    NON-NUMERIC LOW CONFIDENCE LIMIT EXPONENT
 152     ALL       F              SERIES NUMBER INVALID OR MISSING AO CARD
 153     ALL       F              DATA BASE TYPE IS INVALID
 154     ALL       F              TEST SERIES NUMBER NOT IN STATUS FILE
```

```
TERM-012                                  EADS                                  PAGE       4
                                       ERROR  LIST                              DATE 05/12/80

CODE  DATA BASE  TYPE  COMPONENT  MESSAGE
----  ---------  ----  ---------  ------------------------------------------------------------
 155     ALL       F              STATUS FILE MODIFY DID NOT WORK
 156     ALL       F     C1845    NON-NUMERIC TOTAL MG RECOVERED
 157     ALL       F     C1310    NON-NUMERIC STAGE/FILTER CUT SIZE
 158     ALL       F     C410     STREAM NUMBER INVALID OR MISSING CO CARD
 159     ALL       F     C505     DEVICE/PROCESS NUMBER INVALID OR MISSING DO CARD
 160     ALL       F     C810     TEST ID NUMBER INVALID OR MISSING EO CARD
 161     ALL       F     C869     FUELS AND FEEDSTOCKS SEQ NUMBER INVALID OR MISSING FO CARD
 162     ALL       F     C1203    SAMPLE NUMBER INVALID OR MISSING HO CARD
 163     ALL       F     C1305    COMPONENT NAME MISSING
 164     ALL       F     C870     SOURCE FEED MATERIAL MISSING
 165     ALL       F     C1209    MEASUREMENT INSTRUMENT/METHOD NAME MISSING
 166     ALL       F     C1835    SPECIES ID FOR MEG MISALIGNED
 167     ALL       F     C621     INVALID VALUE TYPE
 168     ALL       F     C622     NON-NUMERIC PARAMETER VALUE MANTISSA
 169     ALL       F     C623     NON-NUMERIC PARAMETER VALUE EXPONENT
 170     ALL       F     C1427    NON-NUMERIC LOW DETECTION LIMIT EXPONENT
 171     ALL       F     C1064    INVALID HIGH/LOW 1
 172     ALL       F     C1067    NON-NUMERIC PARAMETER VALUE MANTISSA
 173     ALL       F     C1068    NON-NUMERIC PARAMETER VALUE EXPONENT
 174     ALL       F     C890     NON-NUMERIC PROXIMATE ANALYSIS VALUE
 175     ALL       F     C910     NON-NUMERIC ULTIMATE ANALYSIS PARAMETER VALUE
 176     ALL       F     C924     NON-NUMERIC HIGH DETECTION LIMIT MANTISSA
 177     ALL       F     C925     NON-NUMERIC HIGH DETECTION LIMIT EXPONENT
 178     ALL       F     C927     NON-NUMERIC LOW DETECTION LIMIT MANTISSA
 179     ALL       F     C928     NON-NUMERIC LOW DETECTION LIMIT EXPONENT
 180     ALL       F     C934     NON-NUMERIC VALUE EXPONENT
 181     ALL       F     C935     INVALID HIGH-LOW VALUE
 182     ALL       F     C948     NON-NUMERIC HIGH DETECTION LIMIT MANTISSA
 183     ALL       F     C949     NON-NUMERIC HIGH DETECTION LIMIT EXPONENT
 184     ALL       F     C950     NON-NUMERIC LOW DETECTION LIMIT MANTISSA
 185     ALL       F     C951     NON-NUMERIC LOW DETECTION LIMIT EXPONENT
 186     ALL       F     C1312    INVALID HIGH-LOW VALUE
 187     ALL       F     C1423    NON-NUMERIC HIGH DETECTION LIMIT MANTISSA
 188     ALL       F     C1424    NON-NUMERIC HIGH DETECTION LIMIT EXPONENT
 189     ALL       F     C1426    NON-NUMERIC LOW DETECTION LIMIT MANTISSA
 191     ALL       F     C1841    NON-NUMERIC HIGH DETECTION LIMIT MANTISSA
 192     ALL       F     C1842    NON-NUMERIC HIGH DETECTION LIMIT EXPONENT
 193     ALL       F     C1843    NON-NUMERIC LOW DETECTION LIMIT MANTISSA
 195     ALL       F     C1844    NON-NUMERIC LOW DETECTION LIMIT EXPONENT
 196     ALL       F     C1846    NON-NUMERIC TOTAL MILLIGRAMS RECOVERED
 197     ALL       F     C1847    INVALID HIGH-LOW VALUE
 198     ALL       F     C2586    NON-NUMERIC HIGH DETECTION LIMIT MANTISSA
 199     ALL       F     C2587    NON-NUMERIC HIGH DETECTION LIMIT EXPONENT
 200     ALL       F     C2608    NON-NUMERIC LOW DETECTION LIMIT MANTISSA
 201     ALL       F     C2609    NON-NUMERIC LOW DETECTION LIMIT EXPONENT
 202     ALL       F     C3028    NON-NUMERIC HIGH DETECTION LIMIT MANTISSA
 203     ALL       F     C3029    NON-NUMERIC HIGH DETECTION LIMIT EXPONENT
 204     ALL       F     C3031    NON-NUMERIC LOW DETECTION LIMIT MANTISSA
 205     ALL       F     C3032    NON-NUMERIC LOW DETECTION LIMIT EXPONENT
```

```
TERM-012                                    EADS                                PAGE        5
                                         ERROR  LIST                            DATE 05/12/80

CODE  DATA BASE  TYPE  COMPONENT  MESSAGE
----  ---------  ----  ---------  ------------------------------------------------------------
 207    LEDS      F      C370     NON-NUMERIC SITE LATITUDE
 208    LEDS      F      C372     NON-NUMERIC SITE LONGITUDE
 209    LEDS      F      C374     NON-NUMERIC FRACTION DESIGN RATE OF INDUSTRIAL ORIGIN
 210    LEDS      F      C378     NON-NUMERIC CONTRIBUTING INDUSTRIAL CATEGORY NO
 211    LEDS      F      C382     NON-NUMERIC CATEGORY FLOW CONTRIBUTION
 213    LEDS      F      C384     NON-NUMERIC NUMBER OF ESTAB.
```

APPENDIX A.2

DATA BASE DEFINITION

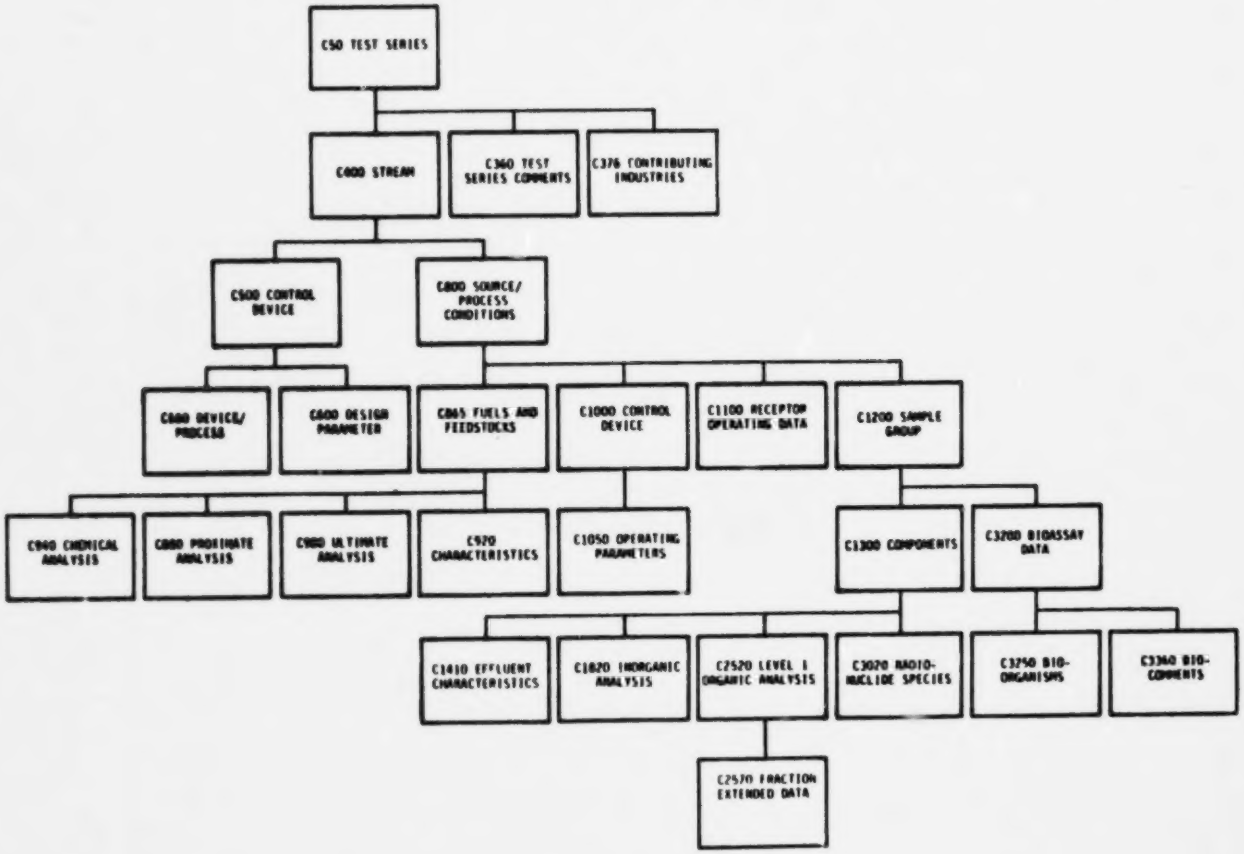

C50 TEST SERIES
C400 STREAM
C360 TEST SERIES COMMENTS
C376 CONTRIBUTING INDUSTRIES
C500 CONTROL DEVICE
C800 SOURCE/ PROCESS CONDITIONS
C680 DEVICE/ PROCESS
C600 DESIGN PARAMETER
C865 FUELS AND FEEDSTOCKS
C1000 CONTROL DEVICE
C1100 RECEPTOR OPERATING DATA
C1200 SAMPLE GROUP
C940 CHEMICAL ANALYSIS
C880 PROXIMATE ANALYSIS
C900 ULTIMATE ANALYSIS
C920 CHARACTERISTICS
C1050 OPERATING PARAMETERS
C1300 COMPONENTS
C3200 BIOASSAY DATA
C1410 EFFLUENT CHARACTERISTICS
C1820 INORGANIC ANALYSIS
C2520 LEVEL 1 ORGANIC ANALYSIS
C3020 RADIO- NUCLIDE SPECIES
C3250 BIO- ORGANISMS
C3360 BIO- COMMENTS
C2570 FRACTION EXTENDED DATA

Figure A.2-1. EADS data base tree.

```
SYSTEM RELEASE NUMBER   2.80D
DATA BASE NAME IS EADS-EADS
DEFINITION NUMBER 6
DATA BASE CYCLE   273
     10*  EADS (NAME XXXX)
     50*  TEST SERIES (RG)
      101*  FPEIS TEST SERIES NUMBER (INTEGER NUMBER 9(5) IN 50)
      102*  GEDS TEST SERIES NUMBER (INTEGER NUMBER 9(5) IN 50)
      103*  LEDS TEST SERIES NUMBER (INTEGER NUMBER 9(5) IN 50)
      104*  SDDS TEST SERIES NUMBER (INTEGER NUMBER 9(5) IN 50)
      110*  SOURCE CATEGORY (NAME X(20) IN 50)
      120*  SOURCE TYPE (NAME X(20) IN 50)
      125*  PRODUCT/DEVICE (NAME X(20) IN 50)
      130*  PROCESS TYPE (NAME X(20) IN 50)
      140*  DESIGN PROCESS RATE (INTEGER NUMBER 9(6) IN 50)
      145*  DESIGN PROCESS RATE UNITS (NAME X(6) IN 50)
      150*  FEED MATERIAL CATEGORY (NAME X(10) IN 50)
      155*  SPONSOR ORGANIZATION (NAME X(30) IN 50)
      160*  SPONSOR ORGANIZATION CONTRACT NUMBER (NAME X(10) IN 50)
      170*  T.O./TD NUMBER (INTEGER NUMBER 999 IN 50)
      180*  SOURCE NAME (NAME X(23) IN 50)
      190*  SITE NAME (NAME X(25) IN 50)
      200*  ADDRESS (NON-KEY  NAME X(20) IN 50)
      210*  CITY (NAME X(18) IN 50)
      220*  STATE (NAME XX IN 50)
      230*  ZIP CODE (INTEGER NUMBER 9(5) IN 50)
      232*  COUNTRY (NAME X(5) IN 50)
      235*  FPEIS TSN CROSS REFERENCE (INTEGER NUMBER 9(5) IN 50)
      240*  SDDS TSN CROSS REFERENCE (INTEGER NUMBER 9(5) IN 50)
      250*  GEDS TSN CROSS REFERENCE (INTEGER NUMBER 9(5) IN 50)
      260*  LEDS TSN CROSS REFERENCE (INTEGER NUMBER 9(5) IN 50)
      270*  SIC CODE (INTEGER NUMBER 9999 IN 50)
      300*  NPDES NUMBER (NAME X(9) IN 50)
      320*  REFERENCE REPORT - TITLE-1 (NON-KEY  NAME X(65) IN 50)
      321*  REFERENCE REPORT - TITLE-2 (NON-KEY  NAME X(65) IN 50)
      322*  REFERENCE REPORT - AUTHOR (NON-KEY  NAME X(30) IN 50)
      323*  REFERENCE REPORT - NUMBER (NON-KEY  NAME X(20) IN 50)
      324*  REFERENCE REPORT - NTIS NUMBER (NON-KEY  NAME X(20) IN 50)
      325*  REFERENCE REPORT - PUBLICATION DATE (NON-KEY  NAME X(15) IN
            50)

      330*  NAME OF SAMPLING GROUP (NAME X(22) IN 50)
      340*  SERIES START DATE (NON-KEY  DATE IN 50)
      350*  SERIES FINISH DATE (NON-KEY  DATE IN 50)
      355*  DATE OF ENTRY (DATE IN 50)
      370*  SITE LATITUDE (DECIMAL NUMBER 99.99 IN 50)
      372*  SITE LONGITUDE (DECIMAL NUMBER 999.99 IN 50)
      374*  FRACTION DESIGN RATE IND ORIGIN (DECIMAL NUMBER 9.9999 IN 50
            )

      105*  TEST SERIES KEY (NAME X(6) IN 50)
      106*  DB KEY (NAME X IN 50)
      360*  TEST SERIES COMMENTS (RG IN 50)
        361*  TSC-LINE NUMBER (NON-KEY  INTEGER NUMBER 99 IN 360)
        362*  TEST SERIES COMMENT (NON-KEY  TEXT X(63) IN 360)
      376*  CONTRIBUTING INDUSTRIES (RG IN 50)
        378*  CONTRIBUTING INDUSTRIAL CATEGORY NUMBER (INTEGER NUMBER 9(
              5) IN 376)
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 380*  INDUSTRY-COMMERICAL SIC NUMBER (INTEGER NUMBER 9999 IN 376
       )
 382*  CATEGORY FLOW CONTRIBUTION (DECIMAL NUMBER 9.999 IN 376)
 384*  NUMBER OF ESTABLISHMENTS (INTEGER NUMBER 9999 IN 376)
400*  STREAM (RG IN 50)
 410*  STREAM NUMBER (INTEGER NUMBER 99 IN 400)
 420*  STREAM NAME (NAME X(34) IN 400)
 430*  MASS/VOLUMETRIC FLOW RATE (NON-KEY  DECIMAL NUMBER 9(5).9
       IN 400)
 432*  FLOW RATE UNITS (NON-KEY  NAME X(6) IN 400)
 440*  VELOCITY-SAMPLING LOCATION (NON-KEY  DECIMAL NUMBER 999.9
       IN 400)
 450*  TEMPERATURE-SAMPLING LOCATION (NON-KEY  INTEGER NUMBER 999
       9 IN 400)
 460*  PRESSURE-SAMPLING LOCATION (NON-KEY  DECIMAL NUMBER 99.9 I
       N 400)
 470*  MOISTURE CONTENT (NON-KEY  DECIMAL NUMBER 99.9 IN 400)
 475*  STACK HEIGHT (DECIMAL NUMBER 9999.9 IN 400)
 480*  STREAM-COMMENTS 1 (NON-KEY  TEXT X(65) IN 400)
 481*  STREAM COMMENTS 2 (NON-KEY  TEXT X(65) IN 400)
 500*  CONTROL DEVICE/TREATMENT/STORAGE/RECOVERY PROCESS (RG IN 4
       00)
   505*  DEVICE/PROCESS NO (INTEGER NUMBER 99 IN 500)
   510*  GENERIC DEVICE/PROCESS TYPE (NAME X(20) IN 500)
   515*  DESIGN TYPE (NAME X(33) IN 500)
   520*  SPECIFIC PROCESS/DEVICE TYPE (NAME X(20) IN 500)
   530*  DEVICE/PROCESS CLASS (NAME X(12) IN 500)
   540*  DEVICE/PROCESS COMMERCIAL NAME (NAME X(30) IN 500)
   550*  MANUFACTURER (NAME X(30) IN 500)
   580*  DEVICE/PROCESS CATEGORY (RG IN 500)
     585*  DEVICE/PROCESS CATEGORY SEQ NUMBER (INTEGER NUMBER 99
           IN 580)
     590*  DEVICE/PROCESS CATEGORY KEYWORD (NAME X(30) IN 580)
   600*  DESIGN PARAMETER (RG IN 500)
     610*  DES-PARAMETER NUMBER (INTEGER NUMBER 99 IN 600)
     620*  DES-PARAMETER NAME (NON-KEY  NAME X(30) IN 600)
     621*  DES-PARAMETER TYPE (NON-KEY  NAME X IN 600)
     622*  DES-PARAMETER VALUE MAN (NON-KEY  DECIMAL NUMBER 99.99
            IN 600)
     623*  DES-PARAMETER VALUE EXP (NON-KEY  INTEGER NUMBER 99 IN
            600)
     624*  DES-PARAMETER VALUE UNITS (NON-KEY  NAME X(24) IN 600)

     630*  DES-PARAMETER TEXT VALUE (NON-KEY  NAME X(24) IN 600)
 800*  SOURCE/PROCESS CONDITIONS DATA (RG IN 400)
   810*  TEST-ID-NUMBER (INTEGER NUMBER 999 IN 800)
   820*  TEST-DATE (NON-KEY  DATE IN 800)
   830*  TEST-START TIME (NON-KEY  INTEGER NUMBER 9999 IN 800)
   840*  TEST-STOP TIME (NON-KEY  INTEGER NUMBER 9999 IN 800)
   850*  OPERATING MODE (NON-KEY  TEXT X(31) IN 800)
   860*  PERCENT OF DESIGN CAPACITY (NON-KEY  DECIMAL NUMBER 999.
         9 IN 800)
   861*  TEST-COMMENT-1 (NON-KEY  TEXT X(65) IN 800)
   862*  TEST-COMMENT-2 (NON-KEY  TEXT X(65) IN 800)
   863*  TEST-COMMENT-3 (NON-KEY  TEXT X(65) IN 800)
   865*  FUELS-N-FEEDSTOCKS (RG IN 800)
     869*  FF-SEQUENCE NUMBER (INTEGER NUMBER 9 IN 865)
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870*  FF-SOURCE FEED MATERIAL (TEXT X(30) IN 865)
873*  FF-FEED MATERIAL RATE (NON-KEY  TEXT X(17) IN 865)
874*  FF-SAMPLE MASS (NON-KEY  DECIMAL NUMBER 999.99 IN 865)

875*  FF-SAMPLE MASS UNITS (NON-KEY  TEXT X(6) IN 865)
876*  FF-SAMPLE VOLUME (NON-KEY  DECIMAL NUMBER 999.99 IN 86
      5)
877*  FF-LABORATORY NAME (NAME X(40) IN 865)
878*  FF-QA-QC CODE (NAME XXX IN 865)
879*  FF-SAMPLE VOLUME UNITS (NON-KEY  TEXT X(7) IN 865)
970*  FF-COMMENT 1 (NON-KEY  TEXT X(65) IN 865)
971*  FF-COMMENT 2 (NON-KEY  TEXT X(65) IN 865)
972*  FF-COMMENT 3 (NON-KEY  TEXT X(65) IN 865)
880*  FF-PROXIMATE ANALYSIS (RG IN 865)
  885*  FF-PA-PARAMETER (NAME X(16) IN 880)
  890*  FF-PA-PARAMETER VALUE (NON-KEY  DECIMAL NUMBER 9(7).
        99 IN 880)
  895*  FF-PA-PARAMETER-UNITS (NON-KEY  NAME X(5) IN 880)
900*  FF-ULTIMATE ANALYSIS (RG IN 865)
  905*  FF-UA-PARAMETER (NAME X(10) IN 900)
  910*  FF-UA-PARAMETER VALUE (NON-KEY  DECIMAL NUMBER 999.9
        9 IN 900)
920*  FF-CHARACTERISTICS (RG IN 865)
  923*  FF-PARAMETER (NAME X(12) IN 920)
  924*  FF-DETECTION LIMIT-HIGH MAN (NON-KEY  DECIMAL NUMBER
         99.99 IN 920)
  925*  FF-DETECTION LIMIT-HIGH EXP (NON-KEY  INTEGER NUMBER
         99 IN 920)
  926*  FF-ANALYSIS METHOD (NAME XX IN 920)
  927*  FF-DETECTION LIMIT - LOW MAN (NON-KEY  DECIMAL NUMBE
        R 99.99 IN 920)
  928*  FF-DETECTION LIMIT - LOW EXP (NON-KEY  INTEGER NUMBE
        R 99 IN 920)
  929*  FF-DETECTION LIMIT - UNITS (NON-KEY  NAME X(7) IN 92
        0)
  930*  FF-VALUE TYPE (NON-KEY  NAME X IN 920)
  931*  FF-PARAMETER VALUE MAN (NON-KEY  DECIMAL NUMBER 99.9
        9 IN 920)
  932*  FF-VALUE UNITS (NON-KEY  NAME X(18) IN 920)
  933*  FF-TEXT VALUE (NON-KEY  NAME X(18) IN 920)
  934*  FF-PARAMETER VALUE EXP (NON-KEY  INTEGER NUMBER 99 I
        N 920)
  935*  FF-PARAMETER VALUE HIGH-LOW (NON-KEY  NAME X IN 920)

940*  FF-CHEMICAL ANALYSIS (RG IN 865)
  945*  FF-C-CATEGORY/SPECIES (NAME X(10) IN 940)
  946*  FF-C-CS-TYPE (NAME X IN 940)
  947*  FF-C-CS-PRIORITY (NAME X IN 940)
  948*  FF-C-DETECTION LIMIT-HIGH MAN (NON-KEY  DECIMAL NUMB
        ER 99.99 IN 940)
  949*  FF-C-DETECTION LIMIT-HIGH EXP (NON-KEY  INTEGER NUMB
        ER 99 IN 940)
  950*  FF-C-ANALYSIS METHOD (NAME XX IN 940)
  951*  FF-C-DETECTION LIMIT LOW-EXP (NON-KEY  INTEGER NUMBE
        R 99 IN 940)
  952*  FF-C-DETECTION LIMIT UNIT (NON-KEY  NAME X(8) IN 940
        )
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     953*  FF-C-DETECTION LIMIT LOW-MAN (NON-KEY  DECIMAL NUMBE
           R 99.99 IN 940)
     955*  FF-C-TOTAL MG RECOVERED (NON-KEY  DECIMAL NUMBER 9(5
           ).999 IN 940)
     964*  FF-C-CONCENTRATION-HIGH-LOW (NON-KEY  NAME X IN 940)

     965*  FF-C-CATEGORY/SPECIES CONCENTRATION MAN (NON-KEY  DE
           CIMAL NUMBER 9.99 IN 940)
     967*  FF-C-CATEGORY/SPECIES CONCENTRATION EXP (NON-KEY  IN
           TEGER NUMBER 99 IN 940)
     969*  FF-C-CONCENTRATION UNITS (NON-KEY  NAME X(11) IN 940
           )
 1000*  CONTROL DEVICE/TREATMENT PROCESS OPERATING PARAMETERS (R
        G IN 800)
   1010*  OP-DEVICE NUMBER (INTEGER NUMBER 99 IN 1000)
   1050*  OPERATING PARAMETERS (RG IN 1000)
     1060*  OPERATING PARAMETER NUMBER (INTEGER NUMBER 99 IN 105
            0)
     1064*  OPERATING PARAMETER HIGH-LOW (NON-KEY  NAME X IN 105
            0)
     1065*  OPERATING PARAMETER NAME (NON-KEY  NAME X(30) IN 105
            0)
     1066*  OPERATING PARAMETER TYPE (NON-KEY  NAME X IN 1050)
     1067*  OPERATING PARAMETER VALUE MAN (NON-KEY  DECIMAL NUMB
            ER 9.99 IN 1050)
     1068*  OPERATING PARAMETER VALUE EXP (NON-KEY  INTEGER NUMB
            ER 99 IN 1050)
     1069*  OPERATING PARAMETER VALUE UNITS (NON-KEY  NAME X(24)
             IN 1050)
     1070*  OPERATING PARAMETER TEXT VALUE (NON-KEY  NAME X(24)
            IN 1050)
 1100*  RECEPTOR OPERATING DATA (RG IN 800)
 1200*  SAMPLE GROUP (RG IN 800)
   1203*  SMPL-NUMBER (INTEGER NUMBER 99 IN 1200)
   1206*  MEASUREMENT INST/METHOD TYPE (NAME X IN 1200)
   1209*  MEASUREMENT INST/MFTHOD NAME (NAME X(30) IN 1200)
   1212*  SMPL-START TIME (NON-KEY  INTEGER NUMBER 9999 IN 1200)

   1215*  SMPL-DURATION (NON-KEY  INTEGER NUMBER 999 IN 1200)
   1218*  SMPL-MASS/VOLUMETRIC FLOWRATE (NON-KEY  DECIMAL NUMBER
            9(5).9 IN 1200)
   1219*  SMPL-FLOWRATE UNITS (NON-KEY  NAME X(6) IN 1200)
   1221*  SMPL-FLOWRATE MEASUREMENT METHOD (NAME X(20) IN 1200)
   1224*  SMPL-VELOCITY (NON-KEY  DECIMAL NUMBER 999.9 IN 1200)
   1227*  SMPL-TEMPERATURE (NON-KEY  INTEGER NUMBER 9999 IN 1200
          )
   1230*  SMPL-PRESSURE (NON-KEY  INTEGER NUMBER 999 IN 1200)
   1233*  SMPL-MOISTURE CONTENT (NON-KEY  DECIMAL NUMBER 99.9 IN
            1200)
   1236*  SMPL-DENSITY (NON-KEY  DECIMAL NUMBER 99.9 IN 1200)
   1239*  SMPL-DENSITY DETERMINATION (NON-KEY  INTEG"R NUMBER 9
          IN 1200)
   1242*  SAMPLING LOCATION DESCRIPTION (NON-KEY  NAME X(30) IN
          1200)
   1243*  INSTRUMENT TEMPERATURE (NON-KEY  INTEGER NUMBER 9999 I
          N 1200)
   1244*  INSTRUMENT PRESSURE (NON-KEY  INTEGER NUMBER 999 IN 12
        00)
1245*   SAMPLING LOCATION CODE (NAME X IN 1200)
1246*   INSTRUMENT FLOWRATE (NON-KEY  DECIMAL NUMBER 9999.9 IN
         1200)
1247*   SAMPLING LOCATION DEVICE NUMBER (INTEGER NUMBER 99 IN
        1200)
1248*   VOLUME OF SAMPLE (NON-KEY  DECIMAL NUMBER 999.99 IN 12
        00)
1251*   TOTAL MASS (NON-KEY  DECIMAL NUMBER 999.99 IN 1200)
1254*   MASS UNITS (NON-KEY  NAME XX IN 1200)
1257*   PERCENT ISOKINETIC SAMPLING (NON-KEY  INTEGER NUMBER 9
        99 IN 1200)
1260*   CO-2 (NON-KEY  DECIMAL NUMBER 99.99 IN 1200)
1262*   CO (NON-KEY  DECIMAL NUMBER 99.99 IN 1200)
1264*   O-2 (NON-KEY  DECIMAL NUMBER 99.99 IN 1200)
1266*   N-2 (NON-KEY  DECIMAL NUMBER 99.99 IN 1200)
1268*   TRACE GASES IN PPM (NON-KEY  TEXT X(65) IN 1200)
1270*   DILUTION FACTOR (NON-KEY  DECIMAL NUMBER 9999.9 IN 120
        0)
1274*   COLLECTION SURFACE/SUBSTRATE (NON-KEY  TEXT X(55) IN 1
        200)
1276*   PARTICLE DIAMETER BASIS (INTEGER NUMBER 9 IN 1200)
1278*   PARTICLE CONCENTRATION BASIS (INTEGER NUMBER 9 IN 1200
        )
1280*   UPPER BOUNDARY DIAMETER (NON-KEY  DECIMAL NUMBER 999.9
        9 IN 1200)
1282*   CALIBRATION/CALCULATION (NON-KEY  INTEGER NUMBER 9 IN
        1200)
1290*   SMPL-COMMENTS 1 (NON-KEY  TEXT X(65) IN 1200)
1291*   SMPL-COMMENTS 2 (NON-KEY  TEXT X(65) IN 1200)
1292*   SMPL-COMMENTS 3 (NON-KEY  TEXT X(65) IN 1200)
1293*   SMPL-COMMENTS 4 (NON-KEY  TEXT X(65) IN 1200)
1300*   COMPONENT (RG IN 1200)
  1303*   COMPONENT SEQUENCE NO (INTEGER NUMBER 99 IN 1300)
  1305*   SAMPLING EQUIPMENT COMPONENT NAME (NAME X(12) IN 130
          0)
  1310*   STAGE/FILTER CUT SIZE (DECIMAL NUMBER 99.99 IN 1300)

  1312*   MASS HIGH-LOW (NON-KEY  NAME X IN 1300)
  1313*   MASS MAN (NON-KEY  DECIMAL NUMBER 9.99 IN 1300)
  1316*   MASS EXP (NON-KEY  INTEGER NUMBER 99 IN 1300)
  1320*   CHEMICAL ANALYSIS LAB NAME (NAME X(39) IN 1300)
  1321*   CHEMICAL QA-QC CODE (NAME XXX IN 1300)
  1324*   RADIONUCLIDE ANALYSIS LAB NAME (NAME X(40) IN 1300)
  1325*   RAD-QA-QC CODE (NAME XXX IN 1300)
  1330*   COMPONENT ALIQUOT MASS-VOL (NON-KEY  DECIMAL NUMBER
          9999.999 IN 1300)
  1335*   COMPONENT ALIQUOT UNITS (NON-KEY  NAME X(5) IN 1300)

  1349*   UG CONCENTRATION HIGH-LOW (NON-KEY  NAME X IN 1300)
  1350*   UG-DNCM-STAGE-MAN (NON-KEY  DECIMAL NUMBER 9.99 IN 1
          300)
  1351*   UG-DNCM-STAGE-EXP (NON-KEY  INTEGER NUMBER 99 IN 130
          0)
  1352*   CUM-PCT-LESS THAN D50 (NON-KEY  DECIMAL NUMBER 999.9
          9 IN 1300)
  1353*   CUM-UG-ACM LESS THAN D50 MAN (NON-KEY  DECIMAL NUMBE
          R 9.99 IN 1300)
 1354*    CUM-UG-ACM LESS THAN D50 EXP (NON-KEY  INTEGER NUMBE
          R 99 IN 1300)
 1355*    CUM-UG-DNCM LESS THAN D50 MAN (NON-KEY  DECIMAL NUMB
          ER 9.99 IN 1300)
 1356*    CUM-UG-DNCM LESS THAN D50 EXP (NON-KEY  INTEGER NUMB
          ER 99 IN 1300)
 1357*    GEOMETRIC MEAN DIAM-MAN (NON-KEY  DECIMAL NUMBER 9.9
          9 IN 1300)
 1358*    GEOMETRIC MEAN DIAM-EXP (NON-KEY  INTEGER NUMBER 99
          IN 1300)
 1359*    DM-DLOG-MAN (NON-KEY  DECIMAL NUMBER 9.99 IN 1300)
 1360*    DM-DLOG-EXP (NON-KEY  INTEGER NUMBER 99 IN 1300)
 1361*    DN-DLOG-MAN (NON-KEY  DECIMAL NUMBER 9.99 IN 1300)
 1362*    DN-DLOG-EXP (NON-KEY  INTEGER NUMBER 99 IN 1300)
 1363*    NO-DNCM-STAGE MAN (NON-KEY  DECIMAL NUMBER 9.99 IN 1
          300)
 1364*    NO-DNCM-STAGE EXP (NON-KEY  INTEGER NUMBER 99 IN 130
          0)
 1365*    NO-DNCM-HIGH-LOW (NON-KEY  NAME X IN 1300)
 1440*    EC-COMMENT 1 (NON-KEY  TEXT X(63) IN 1300)
 1450*    EC-COMMENT 2 (NON-KEY  TEXT X(63) IN 1300)
 1860*    IA-COMMENT-1 (NON-KEY  TEXT X(63) IN 1300)
 1870*    IA-COMMENT-2 (NON-KEY  TEXT X(63) IN 1300)
 2610*    LIOA-COMMENT-1 (NON-KEY  TEXT X(63) IN 1300)
 2620*    LIOA-COMMENT-2 (NON-KEY  TEXT X(63) IN 1300)
 3050*    RN-COMMENT 1 (NON-KEY  TEXT X(63) IN 1300)
 3051*    RN-COMMENT 2 (NON-KEY  TEXT X(63) IN 1300)
 1410*    EFFLUENT CHARACTERISTICS (RG IN 1300)
   1420*    EC-PARAMETER (NAME X(12) IN 1410)
   1423*    EC-DETECTION LIMIT-HIGH-MAN (NON-KEY  DECIMAL NUMB
            ER 99.99 IN 1410)
   1424*    EC-DETECTION LIMIT-HIGH-EXP (NON-KEY  INTEGER NUMB
            ER 99 IN 1410)
   1425*    EC-ANALYSIS METHOD (NAME XX IN 1410)
   1426*    EC-DETECTION LIMIT -LOW MAN (NON-KEY  DECIMAL NUMB
            ER 9.99 IN 1410)
   1427*    EC-DETECTION LIMIT -LOW EXP (NON-KEY  INTEGER NUMB
            ER 99 IN 1410)
   1428*    EC-DETECTION LIMIT - UNITS (NON-KEY  NAME X(9) IN
            1410)
   1429*    EC-VALUE TYPE (NON-KEY  NAME X IN 1410)
   1430*    EC-VALUE (NON-KEY  DECIMAL NUMBER 9999.9 IN 1410)
   1431*    EC-VALUE UNITS (NON-KEY  NAME X(8) IN 1410)
   1432*    EC-TEXT VALUE (NON-KEY  NAME X(13) IN 1410)
 1820*    INORGANIC ANALYSIS/NON-LEVEL 1 ORGANIC SPECIES (RG I
          N 1300)
   1830*    IA-SPECIES-ID-TYPE (NAME X IN 1820)
   1835*    IA-SPECIES-ID (NAME X(10) IN 1820)
   1840*    IA-ANALYSIS-METHOD (NAME XX IN 1820)
   1841*    IA-DETECTION LIMIT-HIGH-MAN (NON-KEY  DECIMAL NUMB
            ER 99.99 IN 1820)
   1842*    IA-DETECTION LIMIT-HIGH-EXP (NON-KEY  INTEGER NUMB
            ER 99 IN 1820)
   1843*    IA-DETECTION LIMIT-LOW-MAN (NON-KEY  DECIMAL NUMBE
            R 99.99 IN 1820)
   1844*    IA-DETECTION LIMIT-LOW-EXP (NON-KEY  INTEGER NUMBE
           R 99 IN 1820)
  1845*   IA-DETECTION UNIT (NON-KEY  NAME X(8) IN 1820)
  1850*   IA-CONCENTRATION MAN (NON-KEY  DECIMAL NUMBER 9.99
            IN 1820)
  1852*   IA-CONCENTRATION EXP (NON-KEY  INTEGER NUMBER 99 I
           N 1820)
  1846*   IA-TOTAL MG RECOVERED (NON-KEY  DECIMAL NUMBER 9(5
           ).999 IN 1820)
  1847*   IA-HIGH-LOW (NON-KEY  NAME X IN 1820)
  1836*   IA-SPECIES-PRIORITY (NAME X IN 1820)
2520*  LEVEL 1 ORGANIC ANALYSIS (RG IN 1300)
  2530*   L1OA-FRACTION-ID (NAME XXX IN 2520)
  2540*   L1OA-FRACTION-TCO (NON-KEY  DECIMAL NUMBER 9999.99
            IN 2520)
  2550*   L1OA-FRACTION-GRAV (NON-KEY  DECIMAL NUMBER 9999.9
           9 IN 2520)
  2560*   L1OA-FRACTION-TOTAL (NON-KEY  DECIMAL NUMBER 9999.
           99 IN 2520)
  2570*   L1OA-FRACTION-EXTENDED-DATA (RG IN 2520)
    2580*   L1OAFED-CATEGORY/SPECIES TYPE (NAME X IN 2570)
    2582*   L1OAFED-CATEGORY/SPECIES (NAME X(10) IN 2570)
    2583*   L1OAFED-CATEGORY/SPECIES-PRIORITY (NAME X IN 257
             0)
    2585*   L1OAFED-ANALYSIS METHOD (NAME XX IN 2570)
    2586*   L1OAFED-DETECTION LIMIT-HIGH MAN (NON-KEY  DECIM
             AL NUMBER 99.99 IN 2570)
    2587*   L1OAFED-DETECTION LIMIT - HIGH EXP (NON-KEY  INT
             EGER NUMBER 99 IN 2570)
    2588*   L1OAFED-DETECTION LIMIT - UNITS (NON-KEY  NAME X
             (8) IN 2570)
    2590*   L1OAFED-INTENSITY (NON-KEY  INTEGER NUMBER 999 I
             N 2570)
    2595*   L1OAFED-HIGH-LOW (NON-KEY  NAME X IN 2570)
    2600*   L1OAFED-CONCENTRATION MAN (NON-KEY  DECIMAL NUMB
             ER 9.99 IN 2570)
    2605*   L1OAFED-CONCENTRATION EXP (NON-KEY  INTEGER NUMB
             ER 99 IN 2570)
    2608*   L1OAFED-DETECTION LIMIT-LOW-MAN (NON-KEY  DECIMA
             L NUMBER 99.99 IN 2570)
    2609*   L1OAFED-DETECTION LIMIT-LOW EXP (NON-KEY  INTEGE
             R NUMBER 99 IN 2570)
3020*  RADIONUCLIDE-SPECIES CONCENTRATION (RG IN 1300)
  3025*   RN-RADIONUCLIDE ID (NAME X(8) IN 3020)
  3028*   RN-DETECTION LIMIT-HIGH MAN (NON-KEY  DECIMAL NUMB
           ER 99.99 IN 3020)
  3029*   RN-DETECTION LIMIT-HIGH EXP (NON-KEY  INTEGER NUMB
           ER 99 IN 3020)
  3030*   RN-ANALYSIS METHOD (NAME XX IN 3020)
  3031*   RN-DETECTION LIMIT-LOW-MAN (NON-KEY  DECIMAL NUMBE
           R 99.99 IN 3020)
  3032*   RN-DETECTION LIMIT -LOW EXP (NON-KEY  INTEGER NUMB
           ER 99 IN 3020)
  3033*   RN-DETECTION LIMIT - UNITS (NON-KEY  NAME X(8) IN
           3020)
  3034*   RN-CONCENTRATION HIGH-LOW (NON-KEY  NAME X IN 3020
           )
  3035*   RN-CONCENTRATION MAN (NON-KEY  DECIMAL NUMBER 9.99
           IN 3020)
    3040*  RN-CONCENTRATION EXP (NON-KEY  INTEGER NUMBER 99 I
           N 3020)
3200*  BIOASSAY DATA (RG IN 1200)
  3205*  BIO-TEST TYPE (NAME X(25) IN 3200)
  3210*  BIO-TEST NAME (NAME X(30) IN 3200)
  3215*  BIO-TEST DURATION (NON-KEY  INTEGER NUMBER 9(6) IN 3
         200)
  3220*  BIO-SAMPLE ID (NON-KEY  NAME XXXX IN 3200)
  3225*  BIO-TEST LAB NAME (NAME X(41) IN 3200)
  3226*  BIO-TEST QA-QC (NAME XXX IN 3200)
  3230*  BIO-TEST START (NON-KEY  DATE IN 3200)
  3235*  BIO-TEST END (NON-KEY  DATE IN 3200)
  3240*  BIO-TEST SAMPLE QUANTITY (NON-KEY  INTEGER NUMBER 9(
         8) IN 3200)
  3245*  BIO-TEST SAMPLE UNITS (NON-KEY  NAME X(6) IN 3200)
  3280*  BIO-VALUE TYPE (NAME XXXX IN 3200)
  3285*  BIO-VALUE-MAN (NON-KEY  DECIMAL NUMBER 9.99 IN 3200)

  3286*  BIO-VALUE-EXP (NON-KEY  INTEGER NUMBER 99 IN 3200)
  3290*  BIO-VALUE UNITS (NON-KEY  NAME X(8) IN 3200)
  3295*  BIO-HI-CONF-LIMIT-MAN (NON-KEY  DECIMAL NUMBER 9.99
         IN 3200)
  3296*  BIO-HI-CONF-LIMIT-EXP (NON-KEY  INTEGER NUMBER 99 IN
          3200)
  3300*  BIO-LOW-CONF-LIMIT-MAN (NON-KEY  DECIMAL NUMBER 9.99
          IN 3200)
  3301*  BIO-LOW-CONF-LIMIT-EXP (NON-KEY  INTEGER NUMBER 99 I
         N 3200)
  3305*  BIO-MAX-APPLICABLE-DOSE-MAN (NON-KEY  DECIMAL NUMBER
          9.999 IN 3200)
  3306*  BIO-MAX-APPLICABLE-DOSE-EXP (NON-KEY  INTEGER NUMBER
          99 IN 3200)
  3310*  BIO-M-A-D-UNITS (NON-KEY  NAME X(9) IN 3200)
  3315*  BIO-LEVEL OF TOXICITY (NAME X(14) IN 3200)
  3320*  BIO-BACT. MUTAGEN RESPONSE (NAME X(14) IN 3200)
  3325*  BIO-MIN-EFF-CONC-MAN (NON-KEY  DECIMAL NUMBER 9.99 I
         N 3200)
  3326*  BIO-MIN-EFF-CONC-EXP (NON-KEY  INTEGER NUMBER 99 IN
         3200)
  3330*  BIO-MIN EFFECTIVE CONCEN. UNITS (NON-KEY  NAME X(7)
         IN 3200)
  3335*  BIO-APPROX-CONCENTRATION-FACTOR (NON-KEY  NAME X(17)
          IN 3200)
  3250*  BIO-ORGANISMS (RG IN 3200)
    3255*  BIO-ORGANISMS/STRAINS (NAME X(65) IN 3250)
  3360*  BIO-COMMENTS SUMMARY (RG IN 3200)
    3365*  BIO-COMMENT LINE NUMBER (NON-KEY  INTEGER NUMBER 9
           9 IN 3360)
    3370*  BIO-COMMENT (NON-KEY  TEXT X(63) IN 3360)
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APPENDIX A.3

GLOSSARY

The following table is a glossary of the data elements in the EADS waste stream data bases. While this encompasses all the data elements in EADS, note that no single data system (fine particles, gaseous, liquids, or solids) contains all of the data elements. As an example, data element C300 is the NPDES number which occurs only in the Liquid Effluents Data System.

The table lists the name of the data element (in the order it appears on the input forms), the data base variable name (as it is defined in the data base definition), the corresponding component number(s) and field size or format (from the data base definition), and a description of the data element. For further clarification on these definitions, refer to Section 4, the detailed encoding instructions.

In the field size or format, X(20) means an alphanumeric field 20 characters long. The format 9(5) means an integer field, five numbers long, and 9(3).9(2) represents a decimal number field with three numbers before the decimal point and two after.

The exponential format requires two data elements, a decimal number for the mantissa, and an integer number for the exponent. In the description of the data element, the exponential format is written nn.nn E ± nn.

FORM 1 -- Source Description

Data Element Name	Data Base Variable Name	Data Base Component Numbers	Field Size/Format	Description
FPEIS Test Series Number	FPEIS TEST SERIES NUMBER	C101	Integer 9(5)	The permanent, unique number assigned by the EADS Program Manager to each test series in the Fine Particle Emissions Information System.
GEDS Test Series Number	GEDS TEST SERIES NUMBER	C102	Integer 9(5)	The permanent, unique number assigned by the EADS Program Manager to each test series in the Gaseous Emissions Data System.
LEDS Test Series Number	LEDS TEST SERIES NUMBER	C103	Integer 9(5)	The permanent, unique number assigned by the EADS Program Manager to each test series in the Liquid Effluents Data System.
SDDS Test Series Number	SDDS TEST SERIES NUMBER	C104	Integer 9(5)	The permanent, unique number assigned by the EADS Program Manager to each test series in the Solid Discharge Data System.
(Not on Form)	TEST SERIES KEY	C105	Name X(6)	The code letter which identifies the data base (F, G, L, or S) and the Test Series Number for data retrieval purposes.
(Not on Form)	DB KEY	C106	Name X	The code letter which identifies the data base (F, G, L, or S), for data retrieval purposes.
Source Category	SOURCE CATEGORY	C110	Name X(20)	The grouping of major generic industries or source classes; i.e., the broadest description of a source (e.g., COMBUST-ENERGY, CHEMICAL MANUFAC, METALS, and NATURAL PRODUCTS).
Source Type	SOURCE TYPE	C120	Name X(20)	The kind of source within a source category (e.g., INDUSTRIAL, INORGANIC ACIDS, PRIMARY FERROUS, and WOOD).
Product/Device Type	PRODUCT/DEVICE	C125	Name X(20)	The general device or specific product (e.g., BOILER, SULFURIC ACID, STEEL, and PULP AND PAPER).
SIC Code	SIC CODE	C270	Integer 9999	The U.S. Department of Commerce Standard Industrial Classification code.
Process Type	PROCESS TYPE	C130	Name X(20)	The unique process being tested (e.g., TANGENTIAL, CONTACT PROCESS, BLAST FURNACE, and SULFATE PULPING).
Design Process Rate	DESIGN PROCESS RATE	C140	Integer 9(6)	The design capacity of the process.
Process Rate Units	DESIGN PROCESS RATE UNITS	C145	Name X(6)	The design process rate units, reflecting the type of process tested.
Feed Material Category	FEED MATERIAL CATEGORY	C150	Name X(10)	The general category of the process feed material or fuel (e.g., COAL, OIL, GAS, WOOD, SOLIDWASTE, and MTL SCRAP).
Source Name	SOURCE NAME	C180	Name X(23)	The name of the source.
Site Name	SITE NAME	C190	Name X(25)	The name of site where the source is located.

FORM 1 -- Continued

Data Element Name	Data Base Variable Name	Data Base Component Numbers	Field Size/Format	Description
Street/Box Number	ADDRESS	C200	Name X(20)	The number and name of the street address of the site.
City	CITY	C210	Name X(18)	The name of the city, township, or area.
State	STATE	C220	Name XX	The two-letter code for the state or Canadian province.
Zip Code	ZIP CODE	C230	Integer 9(5)	The zip code for the address of the site.
Country	COUNTRY	C232	Name X(5)	The abbreviation for the country in which the source is located.
FPEIS Test Series Number	FPEIS TSN CROSS REFERENCE	C235	Integer 9(5)	The Fine Particle Emissions Information System Test Series Number associated with the fine particulate information which was collected from the same source and at the same time as the data for the test series currently being encoded.
SDDS Test Series Number	SDDS TSN CROSS REFERENCE	C240	Integer 9(5)	The Solid Discharge Data System Test Series Number associated with the solid discharge information which was collected from the same source and at the same time as the data for the test series currently being encoded.
GEDS Test Series Number	GEDS TSN CROSS REFERENCE	C250	Integer 9(5)	The Gaseous Emissions Data System Test Series Number associated with the gaseous information which was collected from the same source and at the same time as the data for the test series currently being encoded.
LEDS Test Series Number	LEDS TSN CROSS REFERENCE	C260	Integer 9(5)	The Liquid Effluents Data System Test Series Number associated with the liquid effluent information which was collected from the same source and at the same time as the data for the test series currently being encoded.
NPDES Number	NPDES NUMBER	C300	Name X(9)	The National Pollutant Discharge Elimination System number assigned by Permit Sections of the State or EPA Regional Offices.
Start Date	SERIES START DATE	C340	Date	The starting date of the sampling activity.
Finish Date	SERIES FINISH DATE	C350	Date	The finishing date of the sampling activity.
(Not on Form)	DATE OF ENTRY	C355	Date	The date indicating when the test series data were loaded into the data base, used for internal records.

FORM 1 -- Concluded

Data Element Name	Data Base Variable Name	Data Base Component Numbers	Field Size/Format	Description
Sponsor Organization	SPONSOR ORGANIZATION	C155	Name X(30)	The name of the organization who sponsored the sampling program (e.g., EPA).
Contract Number	SPONSOR ORGANIZATION CONTRACT NUMBER	C160	Name X(10)	The number of the sponsoring organization contract.
TO/TD Number	T.O./TD NUMBER	C170	Integer 999	The EPA task order or technical directive number.
Name of Sampling Group/ Contractor	NAME OF SAMPLING GROUP	C330	Name X(22)	The name of the sampling group or contractor.
Reference Report Title	REFERENCE REPORT - TITLE-1; -2	C320; C321	Name X(65); Name X(65)	The title of the report in which the data are reported.
Reference Report Author	REFERENCE REPORT - AUTHOR	C322	Name X(30)	The author of the reference report.
Reference Report Number	REFERENCE REPORT - NUMBER	C323	Name X(20)	The number, as assigned by the sponsoring organization, of the reference report.
Reference Report Publication Date	REFERENCE REPORT - PUBLICATION DATE	C325	Name X(15)	The publication date of the reference report, as month and year.
Reference Report NTIS Number	REFERENCE REPORT - NTIS NUMBER	C324	Name X(20)	The NTIS number of the reference report.
Line Number	TSC-LINE NUMBER	C361	Integer 99	The sequential number for each line of test series comments.
Test Series Comments	TEST SERIES COMMENT	C362	Text X(63)	The comments on the test series.

FORM 1A -- Wastewater Collection System Effluent Identification

Data Element Name	Data Base Variable Name	Data Base Component Numbers	Field Size/Format	Description
Site Latitude	SITE LATITUDE	C370	Decimal 99.99	The site latitude in units of degrees North.
Site Longitude	SITE LONGITUDE	C372	Decimal 999.99	The site longitude in units of degrees West.
Fraction Design Rate of Industrial Origin	FRACTION DESIGN RATE IND ORIGIN	C374	Decimal 9.9999	The fraction of the influent stream that is from industrial sources.
Contributing Industrial Category Number	CONTRIBUTING INDUSTRIAL CATEGORY NUMBER	C378	Integer 9(5)	The sequential number for the category of industry or commercial activity that contributes waste flow to the source.
Industry/Commercial SIC Number	INDUSTRY-COMMERCIAL SIC NUMBER	C380	Integer 9999	The U.S. Department of Commerce Standard Industrial Classification code.
Category Flow Contribution	CATEGORY FLOW CONTRIBUTION	C382	Decimal 9.999	The fraction of flow contributed by the industry or commercial activity.
Number of Establishments	NUMBER OF ESTABLISHMENTS	C384	Integer 9999	The number of establishments in the service area.

FORM 2 -- Stream Design Characteristics and Control Device/Treatment Process Data

Data Element Name	Data Base Variable Name	Data Base Component Numbers	Field Size/Format	Description
Stream Number	STREAM NUMBER	C410	Integer 99	The sequential number assigned to each effluent stream sampled at the source.
Flowrate	MASS/VOLUMETRIC FLOWRATE	C430	Decimal 9(5).9	The design total mass or volumetric flowrate of the effluent in the sampled stream at normal maximum operating conditions.
Flowrate Units	FLOW RATE UNITS	C432	Name X(6)	The appropriate units of the stream flowrate.
Velocity	VELOCITY-SAMPLING LOCATION	C440	Decimal 999.9	The design velocity of the effluent stream in m/sec at normal maximum operating conditions.
Temperature	TEMPERATURE-SAMPLING LOCATION	C450	Integer 9999	The design temperature of the effluent stream in degrees Celsius at normal maximum operating conditions.
Pressure	PRESSURE-SAMPLING LOCATION	C460	Decimal 99.9	The design absolute pressure in units of kPa of the effluent stream at normal maximum operating conditions.
Moisture Content	MOISTURE CONTENT	C470	Decimal 99.9	The design moisture content in percent by volume of the effluent stream at normal maximum operating conditions.
Stack Height	STACK HEIGHT	C475	Decimal 9999.9	The height of the stack in meters, relative to ground level.
Stream Name	STREAM NAME	C420	Name X(34)	The name of the effluent stream sampled at the source (e.g., boiler flue gas, process wastewater, bottom ash, etc.).
Stream Comments as Text	STREAM-COMMENTS 1; 2	C480; C481	Text X(65); Text X(65)	The comments on the stream data.
Device Number	DEVICE/PROCESS NO	C505	Integer 99	The number assigned to each control device or treatment, storage, or recovery process, unique within a test series.
Generic Device/Process Type	GENERIC DEVICE/PROCESS TYPE	C510	Name X(20)	The type of generic control device or treatment process.
Design Type	DESIGN TYPE	C515	Name X(33)	The control device/treatment process design type.
Specific Process/Device Type	SPECIFIC PROCESS/DEVICE TYPE	C520	Name X(20)	The control device/treatment process specific type.
Device/Process Class	DEVICE/PROCESS CLASS	C530	Name X(12)	The device/process class.
Device/Process Commercial Name	DEVICE/PROCESS COMMERCIAL NAME	C540	Name X(30)	The commercial name and model number of the device/process.

FORM 2 -- Concluded

Data Element Name	Data Base Variable Name	Data Base Component Numbers	Field Size/Format	Description
Manufacturer	MANUFACTURER	C550	Name X(30)	The name of the device/process manufacturer.
Sequence Number	DEVICE/PROCESS CATEGORY SEQ NUMBER	C585	Integer 99	The sequential number assigned to each device/process keyword.
Device/Process Keyword	DEVICE/PROCESS CATEGORY KEYWORD	C590	Name X(30)	The word that best describe the control device/treatment process in greater detail.
Parameter Number	DES-PARAMETER NUMBER	C610	Integer 99	The sequential number for the design parameter.
Design Parameter Name	DES-PARAMETER NAME	C620	Name X(30)	The name of the design parameter.
Value Type	DES-PARAMETER TYPE	C621	Name X	The code letter for the type of parameter value; T for text or N for number.
Parameter Value	DES-PARAMETER VALUE MAN; EXP	C622; C623	Decimal 99.99; Integer 99	The numeric value of the design parameter, in exponential format, nn.nn E ± nn.
Parameter Value Text/Units	DES-PARAMETER TEXT VALUE; VALUE UNITS	C630; C624	Name X(24); Name X(24)	The text value of the design parameter, or the units of the numeric value of the design parameter.

FORM 3 -- Test Identification and Control Device/Treatment Process Operating Parameters

Data Element Name	Data Base Variable Name	Data Base Component Numbers	Field Size/Format	Description
Test ID Number	TEST-ID-NUMBER	C810	Integer 999	The sequential number for each test. A test is defined as a sample or series of samples at a given point in time for a particular source/control operating condition.
Test Date	TEST-DATE	C820	Date	The date the test was conducted or begun.
Start Time	TEST-START TIME	C830	Integer 9999	The test starting time on the basis of a 24-hour day.
End Time	TEST-STOP TIME	C840	Integer 9999	The test finish time on the basis of a 24-hour day.
Operating Mode	OPERATING MODE	C850	Text X(31)	The mode of operation of the source at the time of the test (e.g., batch, continuous, cyclic, etc.).
Percent of Design Capacity	PERCENT OF DESIGN CAPACITY	C860	Decimal 999.9	The percent of the design capacity at which the source is operating during the test.
Device/Process Number	OP-DEVICE NUMBER	C1010	Integer 99	The unique number previously assigned to each control device/treatment process.
Operating Parameter Number	OPERATING PARAMETER NUMBER	C1060	Integer 99	The sequential number for each control device operating parameter.
Operating Parameter Name	OPERATING PARAMETER NAME	C1065	Name X(30)	The name of the operating parameter.
Value Type	OPERATING PARAMETER TYPE	C1066	Name X	The code letter for the type of parameter value; T for text or N for number.
Less Than/Greater Than Sign	OPERATING PARAMETER HIGH-LOW	C1064	Name X	The appropriate sign indicating if the data are less than or greater than a value.
Parameter Value	OPERATING PARAMETER VALUE MAN; EXP	C1067; C1068	Decimal 9.99; Integer 99	The numeric value of the operating parameter, in exponential format, n.nn E ± nn.
Operating Parameter Text/Units	OPERATING PARAMETER TEXT VALUE; VALUE UNITS	C1070; C1069	Name X(24); Name X(24)	The text value of the operating parameter, or the units of the numeric value of the operating parameter.
Comments as Text	TEST-COMMENT-1; -2; -3	C861; C862; C863	Text X(65); Text X(65); Text X(65)	The comments on the test operating conditions.

FORM 4 -- Fuels and Feedstocks

Data Element Name	Data Base Variable Name	Data Base Component Numbers	Field Size/Format	Description
Source Feed Material	FF-SOURCE FEED MATERIAL	C870	Text X(30)	The specific name of the source feed material (e.g., Western PA Bituminous, Kraft Pulp, etc.).
Feed Material Rate and Units	FF-FEED MATERIAL RATE	C873	Text X(17)	The measured operating (not design) input rate of the source with the appropriate units.
Feed Material Sample Mass	FF-SAMPLE MASS	C874	Decimal 999.99	The mass of the feed material sample.
Feed Material Mass Units	FF-SAMPLE MASS UNITS	C875	Text X(6)	The units of the feed material sample mass.
Sequence Number	FF-SEQUENCE NUMBER	C869	Integer 9	The sequential number that identifies each feed material or fuel type used.
Laboratory Name	FF-LABORATORY NAME	C877	Name X(40)	The name of the laboratory that performed the fuels and feedstocks analysis.
QA/QC Code	FF-QA-QC CODE	C878	Name XXX	The quality assurance/quality control code for the laboratory.
Feed Material Sample Volume	FF-SAMPLE VOLUME	C876	Decimal 999.99	The volume of the feed material sample.
Volume Units	FF-SAMPLE VOLUME UNITS	C879	Text X(7)	The units of the feed material sample volume.
Proximate Analysis Parameter	FF-PA-PARAMETER	C885	Name X(16)	The parameter associated with the proximate fuel analysis, as per ASTM D3172-73.
Value	FF-PA-PARAMETER VALUE	C890	Decimal 9(7).99	The value of the proximate analysis parameter.
Units	FF-PA-PARAMETER-UNITS	C895	Name X(5)	The units of the proximate analysis parameter value.
Ultimate Analysis Parameter	FF-UA-PARAMETER	C905	Name X(10)	The parameter associated with the ultimate fuel analysis, as per ASTM D3176-74.
Value	FF-UA-PARAMETER VALUE	C910	Decimal 999.99	The value of the ultimate analysis parameter in units of percent by weight.
Parameter Name	FF-PARAMETER	C923	Name X(12)	The name of the fuels and feedstocks parameter analyzed (e.g., bulk density, viscosity, pour point, etc.), excluding inorganic trace elements and organic chemical species and compounds.
Value Type	FF-VALUE TYPE	C930	Name X	The code letter for the type of parameter value; T for text or N for number.
Less Than/Greater Than Sign	FF-PARAMETER VALUE HIGH-LOW	C935	Name X	The appropriate sign indicating if the data are less than or greater than a value.

FORM 4 -- Concluded

Data Element Name	Data Base Variable Name	Data Base Component Numbers	Field Size/Format	Description
Value	FF-PARAMETER VALUE MAN; EXP	C931; C934	Decimal 9.99; Integer 99	The value of the parameter, in exponential format n.nn E ± nn.
Units	FF-VALUE UNITS; FF-TEXT VALUE	C932; C933	Name X(18); Name X(18)	The text value of the parameter, or the units of the numeric value of the parameter.
Analytical Method	FF-ANALYSIS METHOD	C926	Name XX	The two-character code for the chemical analysis method used.
High Detection Limit	FF-DETECTION LIMIT-HIGH MAN; EXP	C924; C925	Decimal 99.99; Integer 99	The upper detection limit, in exponential format, nn.nn E ± nn.
Low Detection Limit	FF-DETECTION LIMIT - LOW MAN; EXP	C927; C928	Decimal 99.99; Integer 99	The lower detection limit, in exponential format, nn.nn E ± nn.
Detection Limit Units	FF-DETECTION LIMIT - UNITS	C929	Name X(7)	The units of the upper and lower detection limits.

FORM 5 -- Fuels and Feedstocks -- Chemical Analysis

Data Element Name	Data Base Variable Name	Data Base Component Numbers	Field Size/Format	Description
Chemical ID Type	FF-C-CS-TYPE	C946	Name X	The chemical entry code which determines the type of chemical ID used (C for CAS number or M for MEG number).
Category/Species ID	FF-C-CATEGORY/SPECIES	C945	Name X(10)	The chemical ID for the organic category or species, or the inorganic species.
Species Priority/ Hazardous Pollutant Designation (Not on Form)	FF-C-CS-PRIORITY	C947	Name X	Identification of whether the chemical species is a NRDC Consent Decree Priority Pollutant or a Section 311 Hazardous Pollutant, or both.
Analytical Method	FF-C-ANALYSIS METHOD	C950	Name XX	The two-character code for the chemical analysis method used.
High Detection Limit	FF-C-DETECTION LIMIT HIGH MAN; EXP	C948; C949	Decimal 99.99; Integer 99	The upper detection limit, in exponential format, nn.nn E ± nn.
Low Detection Limit	FF-C-DETECTION LIMIT LOW-MAN; -EXP	C953; C951	Decimal 99.99; Integer 99	The lower detection limit, in exponential format, nn.nn E ± nn.
Detection Limit Units	FF-C-DETECTION LIMIT UNIT	C952	Name X(8)	The units of the upper and lower detection limits.
Total Milligrams Recovered	FF-C-TOTAL MG RECOVERED	C955	Decimal 9(5).999	The total milligrams of the category/species found in the sample.
Less Than/Greater Than Sign	FF-C-CONCENTRATION-HIGH-LOW	C964	Name X	The appropriate sign indicating if the data are less than or greater than a value.
Actual Concentration	FF-C-CATEGORY/SPECIES CONCENTRATION MAN; EXP	C965; C967	Decimal 9.99 Integer 99	The actual concentration of the category/species, in exponential format, n.nn E ± nn.
Actual Concentration Units	FF-C-CONCENTRATION UNITS	C969	Name X(11)	The units of the actual concentration.
Comments as Text	FF-COMMENT 1; 2; 3	C970; C971; C972	Text X(65); Text X(65); Text X(65)	The comments on the analysis of the fuels and feedstocks.

FORM 6 -- Sampling Activity Description

Data Element Name	Data Base Variable Name	Data Base Component Numbers	Field Size/Format	Description
Sample Number	SMPL-NUMBER	C1203	Integer 99	The sequential number for each sample, unique within a Test ID. A sample is the measurement or group of measurements taken with a single measurement method to define the composition of a stream at a given point in time.
Method Type	MEASUREMENT INST/ METHOD TYPE	C1206	Name X	The code letter for the type of measurement instrument/ method; I for inertial impaction (e.g., impactor, SASS), or X for other.
Measurement Instrument/ Method Name	MEASUREMENT INST/ METHOD NAME	C1209	Name X(30)	The name of the measurement instrument/method.
Sampling Start Time	SMPL-START TIME	C1212	Integer 9999	The start time of the sample collection on the basis of a 24-hour day.
Sampling Duration	SMPL-DURATION	C1215	Integer 999	The duration of the sample collection activity in minutes.
Measured Stream Velocity	SMPL-VELOCITY	C1224	Decimal 999.9	The measured velocity of the effluent stream in m/sec.
Measured Stream Temperature	SMPL-TEMPERATURE	C1227	Integer 9999	The measured temperature of the effluent stream in units of degrees Celsius.
Measured Stream Pressure	SMPL-PRESSURE	C1230	Integer 999	The measured absolute pressure of the effluent stream at the sampling location, in units of kPa.
Measured Stream Moisture Content	SMPL-MOISTURE CONTENT	C1233	Decimal 99.9	The measured moisture content of the effluent stream at the sampling location, in units of percent by volume.
Density	SMPL-DENSITY	C1236	Decimal 99.9	The particle density of a particulate laden gas stream, or the bulk density of a solid discharge stream, in g/cm^3.
Density Determination	SMPL-DENSITY DETERMINATION	C1239	Integer 9	The number 1 for measured density, or 0 for assumed density.
Sample Volume	VOLUME OF SAMPLE	C1248	Decimal 999.99	The total volume collected for the sample in units of m^3 (or liters for a liquid sample).
Measured Stream Flowrate	SMPL-MASS/VOLUMETRIC FLOWRATE	C1218	Decimal 9(5).9	The measured total mass or volumetric flowrate of the effluent stream at the sampling location.
Flowrate Units	SMPL-FLOWRATE UNITS	C1219	Name X(6)	The units of the effluent stream flowrate.
Flowrate Measurement Method	SMPL-FLOWRATE MEASUREMENT METHOD	C1221	Name X(20)	The technique or equipment used to determine the effluent stream flowrate.

FORM 6 -- Continued

Data Element Name	Data Base Variable Name	Data Base Component Numbers	Field Size/Format	Description
Sample Total Mass	TOTAL MASS	C1251	Decimal 999.99	The total mass of the sample collected.
Mass Units	MASS UNITS	C1254	Name XX	The units of the sample mass.
Sampling Location Code	SAMPLING LOCATION CODE	C1245	Name X	The code letter for the sampling location; I for inlet of control device/treatment process or for uncontrolled/untreated, 0 for outlet of control device/treatment process, G for treatment plant inlet, H for treatment plant outlet, or S for final sludge disposal outlet.
Device/Process Number	SAMPLING LOCATION DEVICE NUMBER	C1247	Integer 99	The number which identifies to which device or process the sampling location code refers.
Sampling Location Description	SAMPLING LOCATION DESCRIPTION	C1242	Name X(30)	The sampling location description in terms of proximity to control devices and discharge points, including any information that affects the sampling and transport of discharges or emissions.
Instrument Temperature	INSTRUMENT TEMPERATURE	C1243	Integer 9999	The temperature of the sampling instrument in degrees Celsius.
Instrument Pressure	INSTRUMENT PRESSURE	C1244	Integer 999	The inlet absolute pressure of the sampling instrument in kPa.
Instrument Flowrate	INSTRUMENT FLOWRATE	C1246	Decimal 9999.9	The instrument flowrate in liters/minute.
Percent Isokinetic	PERCENT ISOKINETIC SAMPLING	C1257	Integer 999	The percent isokinetic sampling achieved at the sampling location.
CO_2	CO-2	C1260	Decimal 99.99	The amount of CO_2 as a percent of total gas on a dry basis as determined by gas analysis.
CO	CO	C1262	Decimal 99.99	The amount of CO as a percent of total gas on a dry basis as determined by gas analysis.
O_2	O-2	C1264	Decimal 99.99	The amount of O_2 as a percent of total gas on a dry basis as determined by gas analysis.
N_2	N-2	C1266	Decimal 99.99	The amount of N_2 as a percent of total gas on a dry basis as determined by gas analysis.
Dilution Factor	DILUTION FACTOR	C1270	Decimal 9999.9	The ratio of aerosol concentration (on either a mass or number basis) in the original gas stream to that of the measured sample. The number 1 if the aerosol is not diluted, as is the usual case when sampling with impactors.

FORM 6 -- Concluded

Data Element Name	Data Base Variable Name	Data Base Component Numbers	Field Size/Format	Description
Particle Diameter Basis	PARTICLE DIAMETER BASIS	C1276	Integer 9	The number 0 for Stokes particle diameter, 1 for classic aerodynamic particle diameter, or 2 for aerodynamic impaction particle diameter.
Particle Concentration Basis	PARTICLE CONCENTRATION BASIS	C1278	Integer 9	The number 1 if the instrument/method measures mass, or 0 if it measures the number of particles.
Upper Boundary Diameter	UPPER BOUNDARY DIAMETER	C1280	Decimal 999.99	The upper boundary diameter in units of microns.
Calibration/Calculation	CALIBRATION/CALCULATION	C1282	Integer 9	The number 1 for calibrated instrument cut diameters, or 0 for calculated instrument cut diameters.
Trace Gases in PPM	TRACE GASES IN PPM	C1268	Text X(65)	The results of trace gas analysis, with the chemical symbol followed by a dash and the value in parts per million (e.g., S02-15).
Collection Surface/ Substrate	COLLECTION SURFACE/ SUBSTRATE	C1274	Text X(55)	The description of any surface or substrate used for sampling.
Comments as Text	SMPL-COMMENTS 1; 2; 3; 4	C1290; C1291; C1292; C1293	Text X(65); Text X(65); Text X(65); Text X(65)	The comments on the sampling activity.

FORM 7 or 7A -- Component Data and Effluent Characteristics

Data Element Name	Data Base Variable Name	Data Base Component Numbers	Field Size/Format	Description
Component Sequence Number	COMPONENT SEQUENCE NO	C1303	Integer 99	The sequential number for each component of the measurement instrument/method analyzed.
Component Name	SAMPLING EQUIPMENT COMPONENT NAME	C1305	Name X(12)	The specific component of the sampling equipment (e.g., the 10 micron cyclone of a SASS train, the filtrate of a liquid sample, etc.).
Stage/Filter Cut Size	STAGE/FILTER CUT SIZE	C1310	Decimal 99.99	The particle boundary diameter in units of microns.
Less Than/Greater Than Sign	MASS HIGH-LOW; UG CONCENTRATION HIGH-LOW; NO-DNCM-HIGH-LOW	C1312; C1349; C1365	Name X; Name X; Name X	The appropriate sign indicating if the data are less than or greater than a value.
Stage Weight/ Component Mass/ Concentration	MASS MAN; EXP	C1313; C1316	Decimal 9.99; Integer 99	The stage weight (FPEIS), component weight (GEDS, LEDS), or mass (SDDS) in milligrams; or the mass concentration (FPEIS) in micrograms/dry normal cubic meter; or the number concentration (FPEIS) in number of particles/dry normal cubic meter, for the sampling system component, in exponential format, n.nn E ± nn.
Mass Concentration/Stage (Not on Form)	UG-DNCM-STAGE-MAN; -EXP	C1350; C1351	Decimal 9.99; Integer 99	FPEIS Only: The calculated mass concentration per stage in micrograms/dry normal cubic meter, in exponential format, n.nn E ± nn.
Number Concentration/Stage (Not on Form)	NO-DNCM-STAGE MAN; EXP	C1363; C1364	Decimal 9.99; Integer 99	FPEIS Only: The calculated number concentration per stage in number of particles per dry normal cubic meter, in exponential format, n.nn E ± nn.
Cumulative Mass Percent Less Than Stage Size (Not on Form)	CUM-PCT-LESS THAN D50	C1352	Decimal 999.99	FPEIS Only: The calculated cumulative percent of the total mass less than the stage size (d50).
Cumulative Mass/Actual Cubic Meter Less than Stage Size (Not on Form)	CUM-UG-ACM LESS THAN D50 MAN; EXP	C1353; C1354	Decimal 9.99; Integer 99	FPEIS Only: The calculated cumulative mass concentration in micrograms per actual cubic meter, in exponential format, n.nn E ± nn.
Cumulative Mass/ Dry Normal Cubic Meter Less Than Stage Size (Not on Form)	CUM-UG-DNCM LESS THAN D50 MAN; EXP	C1355; C1356	Decimal 9.99; Integer 99	FPEIS Only: The calculated cumulative mass concentration in micrograms per dry normal cubic meter, in exponential format, n.nn E ± nn.
Geometric Mean Diameter/Stage (Not on Form)	GEOMETRIC MEAN DIAM-MAN; -EXP	C1357; C1358	Decimal 9.99; Integer 99	FPEIS Only: The calculated average of the logarithms of the maximum and minimum particle sizes found on the stage, in exponential format, n.nn E ± nn.

FORM 7 or 7A -- Concluded

Data Element Name	Data Base Variable Name	Data Base Component Numbers	Field Size/Format	Description
Differential Mass Concentration/Stage (Not on Form)	DM-DLOG-MAN; -EXP	C1359; C1360	Decimal 9.99; Integer 99	FPEIS Only: The calculated change in mass concentration due to particles caught on this stage (DM/DlogD), in exponential format, n.nn E ± nn.
Differential Number Concentration/Stage (Not on Form)	DN-DLOG-MAN; -EXP	C1361; C1362	Decimal 9.99; Integer 99	FPEIS Only: The calculated change in number concentration due to particles caught on this stage (DN/DlogD), in exponential format, n.nn E ± nn.
Chemical Analysis Laboratory Name	CHEMICAL ANALYSIS LAB NAME	C1320	Name X(39)	The name of the laboratory which performed the chemical analysis on the samples.
Chemical QA/QC Code	CHEMICAL QA-QC CODE	C1321	Name XXX	The QA/QC code for the chemical analysis laboratory.
Radiological QA/QC Code	RAD-QA-QC CODE	C1325	Name XXX	The QA/QC code for the radionuclide analysis laboratory.
Radiological Analysis Laboratory Name	RADIONUCLIDE ANALYSIS LAB NAME	C1324	Name X(40)	The name of the laboratory which performed the radionuclide analysis on the samples.
Component (Aliquot) Mass/Volume	COMPONENT ALIQUOT MASS-VOL	C1330	Decimal 9999.999	The mass or volume of the sample aliquot.
Mass/Volume Units	COMPONENT ALIQUOT UNITS	C1335	Name X(5)	The appropriate units of the sample aliquot.
Effluent Parameter Name	EC-PARAMETER	C1420	Name X(12)	The name of the effluent parameter (e.g., opacity, pH, oil and grease, odor, etc.), excluding organic and inorganic species measurements.
Value Type	EC-VALUE TYPE	C1429	Name X	The code letter for the type of parameter value; T for text or N for number.
Value	EC-VALUE; EC-TEXT VALUE	C1430; C1432	Decimal 9999.9; Name X(13)	The numeric or text value of the effluent parameter.
Value Units	EC-VALUE UNITS	C1431	Name X(8)	The units of the numeric value of the parameter.
Analytical Method	EC-ANALYSIS METHOD	C1425	Name XX	The two-character code for the chemical analysis method used.
High Detection Limit	EC-DETECTION LIMIT-HIGH-MAN; -EXP	C1423; C1424	Decimal 99.99; Integer 99	The lower detection limit, in exponential format, nn.nn E ± nn.
Low Detection Limit	EC-DETECTION LIMIT -LOW MAN; EXP	C1426; C1427	Decimal 9.99; Integer 99	The lower detection limit, in exponential format, n.nn E ± nn.
Detection Limit Units	EC-DETECTION LIMIT - UNITS	C1428	Name X(9)	The units of the upper and lower detection limits.
Comments as Text	EC-COMMENT 1; 2	C1440; C1450	Text X(63); Text X(63)	The comments on the effluent characteristics.

FORM 8 -- Inorganic Analysis/Non-Level 1 Organic Analysis

Data Element Name	Data Base Variable Name	Data Base Component Numbers	Field Size/Format	Description
ID Type	IA-SPECIES-ID-TYPE	C1830	Name X	The chemical entry code which determines the type of chemical ID used (C for CAS number or M for MEG number).
Category/Species ID	IA-SPECIES-ID	C1835	Name X(10)	The chemical ID for the organic category or species, or the inorganic species.
Species Priority/ Hazardous Pollutant Designation (Not on Form)	IA-SPECIES-PRIORITY	C1836	Name X	Identification of whether the chemical species is a NRDC Consent Degree Priority Pollutant or a Section 311 Hazardous Pollutant, or both.
Analytical Method	IA-ANALYSIS-METHOD	C1840	Name XX	The two-character code for the chemical analysis method used.
High Detection Limit	IA-DETECTION LIMIT-HIGH-MAN; -EXP	C1841; C1842	Decimal 99.99; Integer 99	The upper detection limit, in exponential format, nn.nn E ± nn.
Low Detection Limit	IA-DETECTION LIMIT-LOW-MAN; -EXP	C1843; C1844	Decimal 99.99; Integer 99	The lower detection limit, in exponential format, nn.nn E ± nn.
Detection Limit Units	IA-DETECTION UNIT	C1845	Name X(8)	The units of the upper and lower detection limits.
Total Milligrams Recovered	IA-TOTAL MG RECOVERED	C1846	Decimal 9(5).999	The total milligrams of the category/species found in the sample.
Less Than/Greater Than Sign	IA-HIGH-LOW	C1847	Name X	The appropriate sign indicating if the data are less than or greater than a value.
Actual Source Concentration	IA-CONCENTRATION MAN; EXP	C1850; C1852	Decimal 9.99; Integer 99	The actual source concentration for this component of the category/species, in exponential format, n.nn E ± nn; in micrograms per cubic meter (FPEIS and GEDS), per liter (LEDS), or per gram (SDDS).
Comments as Text	IA-COMMENT-1; -2	C1860; C1870	Text X(63); Text X(63)	The comments on the inorganic/non-Level 1 organic analysis data.

FORM 9 -- Level 1 Organic Analysis

Data Element Name	Data Base Variable Name	Data Base Component Numbers	Field Size/Format	Description
Fraction ID	L1OA-FRACTION-ID	C2530	Name XXX	The organic fraction determined by liquid chromatography per Level 1 analysis procedures and designated LC1-LC7, or TOT if the sample was not fractionated.
TCO	L1OA-FRACTION-TCO	C2540	Decimal 9999.99	The total chromatographable organics (TCO) measured for each LC fraction, in milligrams.
Grav.	L1OA-FRACTION-GRAV	C2550	Decimal 9999.99	The weight in milligrams of each LC fraction determined by gravimetric analysis.
(Calculated Data - Not On Form)	L1OA-FRACTION-TOTAL	C2560	Decimal 9999.99	The sum of TCO and GRAV for each LC fraction.
ID Type	L1OAFED-CATEGORY/ SPECIES TYPE	C2580	Name X	The chemical entry code letter M for MEG number, the type of chemical ID used.
Category/Species ID	L1OAFED-CATEGORY/SPECIES	C2582	Name X(10)	The MEG ID number for the organic chemical category or species.
Species Priority/ Hazardous Pollutant Designation (Not on Form)	L1OAFED-CATEGORY/SPECIES-PRIORITY	C2583	Name X	Identification of whether the chemical species is a NRDC Consent Decree Priority Pollutant or a Section 311 Hazardous Pollutant, or both.
Analytical Method	L1OAFED-ANALYSIS METHOD	C2585	Name XX	The two-character code for the chemical analysis method used.
High Detection Limit	L1OAFED-DETECTION LIMIT-HIGH MAN; EXP	C2586; C2587	Decimal 99.99; Integer 99	The upper detection limit, in exponential format, nn.nn E ± nn.
Low Detection Limit	L1OAFED-DETECTION LIMIT-LOW-MAN; EXP	C2608; C2609	Decimal 99.99; Integer 99	The lower detection limit, in exponential format, nn.nn E ± nn.
Detection Limit Units	L1OAFED-DETECTION LIMIT - UNITS	C2588	Name X(8)	The units of the upper and lower detection limits.
Intensity	L1OAFED-INTENSITY	C2590	Integer 999	The assigned intensity (in essence a weighting factor) used to indicate relative presence of chemical categories obtained from either infrared (IR) or low resolution mass spectrometry (LRMS) analysis data. Values are 100, 10 or 1 and are used to calculate concentration estimates.
Less Than/Greater Than Sign	L1OAFED-HIGH-LOW	C2595	Name X	The appropriate sign indicating if the data are less than or greater than a value.
Actual Source Concentration	L1OAFED-CONCENTRATION MAN; EXP	C2600; C2605	Decimal 9.99; Integer 99	The actual source concentration for this component of the category/species, in exponential format, n.nn E ± nn, in micrograms per cubic meter (FPEIS and GEDS), per liter (LEDS), or per gram (SDDS).
Comments as Text	L1OA-COMMENT-1; -2	C2610; C2620	Text X(63); Text X(63)	The comments on the Level 1 organic analysis.

FORM 10 -- Radionuclide Data

Data Element Name	Data Base Variable Name	Data Base Component Numbers	Field Size/Format	Description
Radionuclide ID	RN-RADIONUCLIDE ID	C3025	Name X(8)	The name of the isotope assayed, as a symbol followed by a dash and the mass number (e.g., RA-226, U-235, etc.).
Analytical Method	RN-ANALYSIS METHOD	C3030	Name XX	The two-character code for the assay (analysis) method used.
High Detection Limit	RN-DETECTION LIMIT-HIGH MAN; EXP	C3028; C3029	Decimal 99.99; Integer 99	The upper detection limit, in exponential format, nn.nn E ± nn.
Low Detection Limit	RN-DETECTION LIMIT -LOW-MAN; EXP	C3031; C3032	Decimal 99.99; Integer 99	The lower detection limit, in exponential format, nn.nn E ± nn.
Detection Limit Units	RN-DETECTION LIMIT - UNITS	C3033	Name X(8)	The units of the upper and lower detection limits.
Less Than/Greater Than Sign	RN-CONCENTRATION HIGH-LOW	C3034	Name X	The appropriate sign indicating if data are less than or greater than a value.
Actual Source Concentration	RN-CONCENTRATION MAN; EXP	C3035; C3040	Decimal 9.99; Integer 99	The actual source concentration for this component of the isotope, in exponential format, n.nn E ± nn, in pCi per cubic meter (FPEIS and GEDS), per liter (LEDS), or per gram (SDDS).
Comments as Text	RN-COMMENT 1; 2	C3050; C3051	Text X(63); Text X(63)	The comments on the radionuclide data.

FORM 11 -- Bioassay Data

Data Element Name	Data Base Variable Name	Data Base Component Numbers	Field Size/Format	Description
Test Type	BIO-TEST TYPE	C3205	Name X(25)	The name of the broad category of bioassay test type.
Test Name	BIO-TEST NAME	C3210	Name X(30)	The exact name of the bioassay test (a subset of Test Type).
Test Duration	BIO-TEST DURATION	C3215	Integer 9(6)	The duration of the test in hours.
Lab Sample ID	BIO-SAMPLE ID	C3220	Name XXXX	The unique sample ID assigned by the test laboratory.
Test Laboratory Name	BIO-TEST LAB NAME	C3225	Name X(41)	The name of the bioassay testing laboratory.
Lab QA/QC Code	BIO-TEST QA-QC	C3226	Name XXX	The bioassay laboratory QA/QC code.
Test Start	BIO-TEST START	C3230	Date	The start date of the bioassay test.
Test End	BIO-TEST END	C3235	Date	The end date of the bioassay test.
Sample Quantity	BIO-TEST SAMPLE QUANTITY	C3240	Integer 9(8)	The quantity of sample submitted for analysis.
Sample Quantity Units	BIO-TEST SAMPLE UNITS	C3245	Name X(6)	The units of the sample quantity.
Test Organisms/Strains	BIO-ORGANISMS/STRAINS	C3255	Name X(65)	The name of the specific test organism used (e.g., SALMONELLA TYPHIMURIUM TA-1538 or TA-98, etc.).
Type of Value	BIO-VALUE TYPE	C3280	Name XXXX	The value type (e.g., LD50, LC50, EC50, etc.) depending on the assay.
Value	BIO-VALUE-MAN; -EXP	C3285; C3286	Decimal 9.99; Integer 99	The value of the assay results, in exponential format, n.nn E ± nn.
Value Units	BIO-VALUE UNITS	C3290	Name X(8)	The units of the assay results value.
High Confidence Limit	BIO-HI-CONF-LIMIT-MAN; -EXP	C3295; C3296	Decimal 9.99; Integer 99	The upper confidence limit of the assay results value, in exponential format, n.nn E ± nn.
Low Confidence Limit	BIO-LOW-CONF-LIMIT-MAN; -EXP	C3300; C3301	Decimal 9.99; Integer 99	The lower confidence limit of the assay results value, in exponential format, n.nn E ± nn.
Maximum Applicable Dose	BIO-MAX-APPLICABLE-DOSE-MAN; -EXP	C3305; C3306	Decimal 9.999; Integer 99	The technical limitation on the dose allowed in a particular assay, in exponential format, n.nnn E ± nn.
Maximum Applicable Dose Units	BIO-M-A-D-UNITS	C3310	Name X(9)	The units of the maximum applicable dose.

FORM 11 -- Concluded

Data Element Name	Data Base Variable Name	Data Base Component Numbers	Field Size/Format	Description
Level of Toxicity	BIO-LEVEL OF TOXICITY	C3315	Name X(14)	The qualitative bioassay result, as HIGH, MODERATE, LOW, or NOT DETECTABLE.
Bacteria Mutagenicity Response	BIO-BACT. MUTAGEN RESPONSE	C3320	Name X(14)	The Ames test response, as POSITIVE or NEGATIVE.
Minimum Effective Concentration	BIO-MIN-EFF-CONC-MAN; -EXP	C3325; C3326	Decimal 9.99; Integer 99	The minimum effective concentration, in exponential format n.nn E ± nn.
Minimum Effective Concentration Units	BIO-MIN-EFFECTIVE CONCEN. UNITS	C3330	Name X(7)	The units of the minimum effective concentration.
Approximate Concentration Factor	BIO-APPROX-CONCENTRATION-FACTOR	C3335	Name X(17)	The factor which accounts for any aliquot taken during the bioassay lab procedures; not the process stream flow.
Line Number	BIO-COMMENT LINE NUMBER	C3365	Integer 99	The line number for the bioassay comments.
Comments as Text	BIO-COMMENT	C3370	Text X(63)	The comments on the bioassay data.

APPENDIX A.4

GEDS DATA INPUT FORMS

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A - SOURCE DESCRIPTION

Test Series No.		Card No.	Source Category	Source Type	Product/Device Type	SIC Code
1 2 3 4 5 6	7 8 9 10 11 12 13	14 15	16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35	36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55	56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75	76 77 78 79
G		A 0				

Card No.	Process Type	Design Process Rate	Process Rate Units	Feed Material Category	Source Name
14 15	16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35	36 37 38 39 40 41	42 43 44 45 46 47	48 49 50 51 52 53 54 55 56 57	58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80
A 1					

Card No.	Site Name	Street/Box Number	City	State
14 15	16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40	41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60	61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78	79 80
A 2				

Card No.	Zip Code	Country	FPEIS TSN	SDDS TSN	GEDS TSN	LEDS TSN	NPDES Number	Start Date			Finish Date			
								Mo	Da	Yr	Mo	Da	Yr	
14 15	16 17 18 19 20	21 22 23 24 25	26 27 28 29 30	31 32 33 34 35	36 37 38 39 40	41 42 43 44 45	46 47 48 49 50 51 52 53 54	55 56	57 58	59 60	61 62	63 64	65 66	67 68 69 70 71 72 73 74 75 76 77 78 79 80
A 3														

Card No.	Sponsor Organization	Contract Number	TO/TD Number	Name of Sampling Group/Contractor
14 15	16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45	46 47 48 49 50 51 52 53 54 55	56 57 58	59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80
A 4				

Card No.	Reference Report Title
14 15	16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80
A 5	
A 5	

Card No.	Reference Report Author	Reference Report Number	Reference Report Publication Date
14 15	16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45	46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65	66 67 68 69 70 71 72 73 74 75 76 77 78 79 80
A 7			

Card No.	Reference Report NTIS Number	
14 15	16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35	36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80
A 8		

B - TEST SERIES COMMENTS

Test Series No.		Card No.	Line No.	Comments as Text
1 2 3 4 5 6	7 8 9 10 11 12 13	14 15	16 17	18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80
G		B 0		
		B 0		
		B 0		
		B 0		
		B 0		

NOTE: When encoding data, use a Ø for alpha character and 0 for numeric zero.

Page ____ of ____

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C - STREAM DESIGN CHARACTERISTICS

Test Series No. (1–6)	Stream No. (7–8)	(9–13)	Card No. (14–15)	Flowrate* (16–21)	Flowrate Units* (22–27)	Velocity* (28–31)	Temperature* (32–35)	Pressure* (36–38)	Moist. Con.* (39–41)	Stack Height* (42–46)	Stream Name* (47–80)
G			C 0								

Card No. (14–15)	Stream Comments as Text* (16–80)
C 1	
C 2	

D - CONTROL DEVICE/TREATMENT PROCESS

Test Series No. (1–6)	Stream No. (7–8)	(9–13)	Card No. (14–15)	Device No. (16–17)	Generic Device/Process Type (18–37)	Design Type (38–70)	(71–80)
G			D 0				

Card No. (14–15)	Specific Process/Device Type (16–35)	Device/Process Class (36–47)	Device/Process Commercial Name (48–77)	(78–80)
D 1				

Card No. (14–15)	Manufacturer (16–45)	(46–80)
D 2		

Card No. (14–15)	Seq. No. (16–17)	Device/Process Keyword (18–47)	Seq. No. (48–49)	Device/Process Keyword (50–79)	(80)
D 3					
D 3					
D 3					

D - CONTROL DEVICE/PROCESS DESIGN PARAMETERS

Test Series No. (1–6)	Stream No. (7–8)	(9–13)	Card No. (14–15)	Parameter No. (16–17)	Design Parameter Name (18–47)	Value Type (48)	Parameter Value ± (49–56)	Parameter Value Text/Units (57–80)
G			D 4				▲ E	
			D 4				▲ E	
			D 4				▲ E	
			D 4				▲ E	
			D 4				▲ E	
			D 4				▲ E	
			D 4				▲ E	

*Denotes Repetitive Data Feature at Stream Level

NOTE: When encoding data, use a ø for alpha character and 0 for numeric zero.

Page ____ of ____

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FORM 3 2/80

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E - TEST IDENTIFICATION

	Test Series No.	Stream No.	Test ID. No.		Card No.	Test Date Mo	Test Date Da	Test Date Yr	Start Time	End Time	Operating Mode*	% Design Capacity*	
1	2 3 4 5 6	7 8	9 10 11	12 13	14 15	16 17	18 19	20 21	22 23 24 25	26 27 28 29	30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60	61 62 63 ▲ 64	65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80
G					E 0								

E - CONTROL DEVICE/PROCESS OPERATING PARAMETERS

	Test Series No.	Stream No.	Test ID. No.		Card No.	Device/Process Number
1	2 3 4 5 6	7 8	9 10 11	12 13	14 15	16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80
G					E 1	

Card No.	Operating Parameter Number	Operating Parameter Name*	Value Type	Parameter Value $ ±	Operating Parameter Text/Units
14 15	16 17	18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47	48	49 50 51 52 53 54 55 56	57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80
E 2				▲ E	
E 2				▲ E	
E 2				▲ E	
E 2				▲ E	
E 2				▲ E	
E 2				▲ E	
E 2				▲ E	
E 2				▲ E	
E 2				▲ E	

Card No.	Device/Process Number
14 15	16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80
E 1	

Card No.	Operating Parameter Number	Operating Parameter Name*	Value Type	Parameter Value $ ±	Operating Parameter Text/Units
14 15	16 17	18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47	48	49 50 51 52 53 54 55 56	57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80
E 2				▲ E	
E 2				▲ E	
E 2				▲ E	
E 2				▲ E	
E 2				▲ E	
E 2				▲ E	
E 2				▲ E	
E 2				▲ E	
E 2				▲ E	

Card No.	Comments as Text*
14 15	16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80
E 7	
E 8	
E 9	

*Denotes Repetitive Data Feature at Test Level

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Page ____ of ____

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F - FUELS AND FEEDSTOCKS

Test Series No. (1–6)	Stream No. (7–8)	Test ID. No. (9–11)	(12–13)	Card No. (14–15)	Source Feed Material* (16–45)	Feed Material Rate & Units* (46–62)	Feed Material Sample Mass* (63–67)	Feed Material Mass Units* (68–73)	Seq. No. (74–80)
G				F 0					

	Card No. (14–15)	Laboratory Name* (16–55)	QA/QC Code (56–58)	Feed Material Sample Volume* (59–63)	Volume Units* (64–70)	Seq. No. (71–80)
	F 1					

F - FUELS AND FEEDSTOCKS — PROXIMATE ANALYSIS

Test Series No. (1–6)	Stream No. (7–8)	Test ID. No. (9–11)	(12–13)	Card No. (14–15)	Proximate Analysis Parameter (16–31)	Value* (32–38)	Units (39–42)	Proximate Analysis Parameter (43–61)	Value* (62–68)	Units (69–73)	Seq. No. (74–80)
G				F 2	MØISTURE		%WT	ASH			
				F 2	VØLATILE MATTER		%WT	FIXED CARBØN		%WT	
				F 2	SULFUR		%WT	HEAT CØNTENT		%WT	
				F 2	SPECIFIC GRAVITY					KJ/KG	

F - FUELS AND FEEDSTOCKS — ULTIMATE ANALYSIS

Test Series No. (1–6)	Stream No. (7–8)	Test ID. No. (9–11)	(12–13)	Card No. (14–15)	Ultimate Analysis Parameter (16–25)	Value* (26–30)	Ultimate Analysis Parameter (31–40)	Value* (41–45)	Ultimate Analysis Parameter (46–55)	Value* (56–60)	Ultimate Analysis Parameter (61–70)	Value* (71–75)	Seq. No. (76–80)
Ø				F 3	CARBØN		HYDRØGEN		SULFUR		NITRØGEN		
				F 3	ASH		CHLØRINE		MØISTURE		ØXYGEN		

F - FUELS AND FEEDSTOCKS — CHARACTERISTICS

Test Series No. (1–6)	Stream No. (7–8)	Test ID. No. (9–11)	(12–13)	Card No. (14–15)	Parameter Name (16–27)	Value Type* (28)	Value* (29–33)	± (34–36)	Units* (37–55)	Analytical Method* (56)	High Detection Limit* (57–61)	± (62–64)	Low Detection Limit* (65–69)	± (70–72)	Detection Limit Units* (73–78)	Seq. No. (79–80)
G				F 4			E				E		E			
				F 4			E				E		E			
				F 4			E				E		E			
				F 4			E				E		E			
				F 4			E				E		E			
				F 4			E				E		E			
				F 4			E				E		E			
				F 4			E				E		E			
				F 4			E				E		E			
				F 4			E				E		E			
				F 4			E				E		E			
				F 4			E				E		E			

*Denotes Repetitive Data Feature at Test Level

NOTE: When encoding data, use a Ø for alpha character and 0 for numeric zero.

Page ____ of ____

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F - FUELS AND FEEDSTOCKS - CHEMICAL ANALYSIS

	Test Series No.	Stream No.	Test ID. No.		Card No.	Chemical ID Type	Category/Species ID	Analytical Method	High Detection Limit	±	Low Detection Limit	±	Detection Limit Units	Total Milligrams Recovered	Actual Concentration	±	Actual Concentration Units	Seq. No.
1	2 3 4 5 6	7 8	9 10 11	12 13	14 15	16	17 18 19 20 21 22 23 24 25 26	27 28	29 30 31 32	33 34 35 36	37 38 39 40	41 42 43 44	45 46 47 48 49 50 51 52	53 54 55 56 57 58 59 60	< 61 62 63 64	65 66 67 68	69 70 71 72 73 74 75 76 77 78	79 80
G					F 5				▲	E	▲	E		▲	▲	E		
					F 5				▲	E	▲	E		▲	▲	E		
					F 5				▲	E	▲	E		▲	▲	E		
					F 5				▲	E	▲	E		▲	▲	E		
					F 5				▲	E	▲	E		▲	▲	E		
					F 5				▲	E	▲	E		▲	▲	E		
					F 5				▲	E	▲	E		▲	▲	E		
					F 5				▲	E	▲	E		▲	▲	E		
					F 5				▲	E	▲	E		▲	▲	E		
					F 5				▲	E	▲	E		▲	▲	E		
					F 5				▲	E	▲	E		▲	▲	E		
					F 5				▲	E	▲	E		▲	▲	E		
					F 5				▲	E	▲	E		▲	▲	E		
					F 5				▲	E	▲	E		▲	▲	E		
					F 5				▲	E	▲	E		▲	▲	E		
					F 5				▲	E	▲	E		▲	▲	E		
					F 5				▲	E	▲	E		▲	▲	E		
					F 5				▲	E	▲	E		▲	▲	E		
					F 5				▲	E	▲	E		▲	▲	E		
					F 5				▲	E	▲	E		▲	▲	E		
					F 5				▲	E	▲	E		▲	▲	E		
					F 5				▲	E	▲	E		▲	▲	E		
					F 5				▲	E	▲	E		▲	▲	E		
					F 5				▲	E	▲	E		▲	▲	E		
					F 5				▲	E	▲	E		▲	▲	E		
					F 5				▲	E	▲	E		▲	▲	E		
					F 5				▲	E	▲	E		▲	▲	E		
					F 5				▲	E	▲	E		▲	▲	E		
					F 5				▲	E	▲	E		▲	▲	E		
					F 5				▲	E	▲	E		▲	▲	E		
					F 5				▲	E	▲	E		▲	▲	E		
					F 5				▲	E	▲	E		▲	▲	E		
					F 5				▲	E	▲	E		▲	▲	E		
					F 5				▲	E	▲	E		▲	▲	E		
					F 5				▲	E	▲	E		▲	▲	E		
					F 5				▲	E	▲	E		▲	▲	E		
					F 5				▲	E	▲	E		▲	▲	E		

F - FUELS AND FEEDSTOCKS - COMMENTS

	Test Series No.	Stream No.	Test ID. No.		Card No.	Comments as Text *	Seq. No.
1	2 3 4 5 6	7 8	9 10 11	12 13	14 15	16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78	79 80
G					F 7		
G					F 8		
G					F 9		

*Denotes Repetitive Data Feature at **Test Level**

NOTE: When encoding data, use a Ø for alpha character and 0 for numeric zero.

Page _____ of _____

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GASEOUS EMISSIONS DATA SYSTEM

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H - SAMPLING ACTIVITY DESCRIPTION

Test Series No. (1–6) | Stream No. (7–8) | Test ID. No. (9–11) | Smpl. No. (12–13) | Card No. (14–15) | Measurement Instrument / Method Name* | Sampling Start Time | Sampling Duration* (Min) | Meas. Stream Velocity* | Meas. Stream Temp.* | Meas. Stream Pressure* | Meas. Moist. Con.* | Meas. Stream Density* | Density Determination* | Sample Volume

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80

G … H 0

Card No. | Meas. Stream Flowrate* | Flowrate Units* | Flowrate Measurement Method* | Sample Total Mass* | Mass Units*

14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80

H 1

Card No. | Sampling Location Code | Device/Process Number | Sampling Location Description*

14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80

H 2

Card No. | % Iso-kinetic* | CO_2* | CO* | O_2* | N_2* | Dilution Factor* | Particle Diameter Basis* | Particle Concentration Basis* | Upper Diameter Boundary* | Calibration/Calculation*

14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80

H 3

Card No. | Trace Gases In PPM*

14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80

H 4

Card No. | Collection Surface/Substrate*

14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80

H 5

Card No. | Comments as Text*

14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80

H 6
H 7
H 8
H 9

*Denotes Repetitive Data Feature at Sample Level

NOTE: When encoding data, use a Ø for alpha character and 0 for numeric zero.

Page ____ of ____

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K - COMPONENT

	Test Series No.	Stream No.	Test ID. No.	Smpl. No.	Card No.	Component Sequence Number	Component Name	Stage/ Filter Cut Size	Component Weight $ ±	Chemical Analysis Laboratory Name*
1	2 3 4 5 6	7 8	9 10 11	12 13	14 15	16 17	18 19 20 21 22 23 24 25 26 27 28 29	30 31 32 33	34 35 36 37 38 39 40 41	42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80
G					K 0			▲	▲ E	

Card No.	Component Sequence Number	Chem. QA/QC Code	Rad. QA/QC Code	Radiological Analysis Laboratory Name*	Component (Aliquot) Mass/Volume	Mass/Volume Units	
14 15	16 17	18 19 20	21 22 23	24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63	64 65 66 67 68 69 70	71 72 73 74 75	76 77 78 79 80
K 1					▲		

K - EFFLUENT CHARACTERISTICS

	Test Series No.	Stream No.	Test ID. No.	Smpl. No.	Card No.	Component Sequence Number	Effluent Parameter Name	Value Type*	Value*	Value Units*	Analytical Method*	High Detection Limit* ±	Low Detection Limit* ±	Detection Limit Units*	
1	2 3 4 5 6	7 8	9 10 11	12 13	14 15	16 17	18 19 20 21 22 23 24 25 26 27 28 29	30	31 32 33 34 35	36 37 38 39 40 41 42 43	44 45	46 47 48 49 50 51 52 53	54 55 56 57 58 59 60	61 62 63 64 65 66 67 68 69	70 71 72 73 74 75 76 77 78 79 80
G					K 2				▲			▲ E	▲ E		
					K 2				▲			▲ E	▲ E		
					K 2				▲			▲ E	▲ E		
					K 2				▲			▲ E	▲ E		
					K 2				▲			▲ E	▲ E		
					K 2				▲			▲ E	▲ E		
					K 2				▲			▲ E	▲ E		
					K 2				▲			▲ E	▲ E		
					K 2				▲			▲ E	▲ E		
					K 2				▲			▲ E	▲ E		
					K 2				▲			▲ E	▲ E		
					K 2				▲			▲ E	▲ E		
					K 2				▲			▲ E	▲ E		
					K 2				▲			▲ E	▲ E		
					K 2				▲			▲ E	▲ E		
					K 2				▲			▲ E	▲ E		
					K 2				▲			▲ E	▲ E		
					K 2				▲			▲ E	▲ E		
					K 2				▲			▲ E	▲ E		
					K 2				▲			▲ E	▲ E		
					K 2				▲			▲ E	▲ E		
					K 2				▲			▲ E	▲ E		
					K 2				▲			▲ E	▲ E		
					K 2				▲			▲ E	▲ E		
					K 2				▲			▲ E	▲ E		
					K 2				▲			▲ E	▲ E		

K - EFFLUENT CHARACTERISTICS COMMENTS

	Test Series No.	Stream No.	Test ID. No.	Smpl. No.	Card No.	Component Sequence Number	Comments as Text
1	2 3 4 5 6	7 8	9 10 11	12 13	14 15	16 17	18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80
G					K 3		
G					K 4		

*Denotes Repetitive Data Feature at Component Level

NOTE: When encoding data, use a Ø for alpha character and 0 for numeric zero.

Page ____ of ____

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GASEOUS EMISSIONS DATA SYSTEM

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L - INORGANIC ANALYSIS/NON-LEVEL 1 ORGANIC ANALYSIS

Test Series No. (1–6)	Stream No. (7–8)	Test ID No. (9–11)	Smpl. No. (12–13)	Card No. (14–15)	Component Sequence Number (16–17)	ID Type (18)	Category/Species ID (19–28)	Analytical Method (29–30)	High Detection Limit (31–35)	± (36–38)	Low Detection Limit (39–43)	± (44–46)	Detection Limit Units (47–54)	Total Milligrams Recovered (55–62)	Actual Source Concentration (µg/m³) ≤ (63–67)	± (68–70)	71–80
G				L 0					▲	E	▲	E		▲	▲ E		
				L 0					▲	E	▲	E		▲	▲ E		
				L 0					▲	E	▲	E		▲	▲ E		
				L 0					▲	E	▲	E		▲	▲ E		
				L 0					▲	E	▲	E		▲	▲ E		
				L 0					▲	E	▲	E		▲	▲ E		
				L 0					▲	E	▲	E		▲	▲ E		
				L 0					▲	E	▲	E		▲	▲ E		
				L 0					▲	E	▲	E		▲	▲ E		
				L 0					▲	E	▲	E		▲	▲ E		
				L 0					▲	E	▲	E		▲	▲ E		
				L 0					▲	E	▲	E		▲	▲ E		
				L 0					▲	E	▲	E		▲	▲ E		
				L 0					▲	E	▲	E		▲	▲ E		
				L 0					▲	E	▲	E		▲	▲ E		
				L 0					▲	E	▲	E		▲	▲ E		
				L 0					▲	E	▲	E		▲	▲ E		
				L 0					▲	E	▲	E		▲	▲ E		
				L 0					▲	E	▲	E		▲	▲ E		
				L 0					▲	E	▲	E		▲	▲ E		
				L 0					▲	E	▲	E		▲	▲ E		
				L 0					▲	E	▲	E		▲	▲ E		
				L 0					▲	E	▲	E		▲	▲ E		
				L 0					▲	E	▲	E		▲	▲ E		
				L 0					▲	E	▲	E		▲	▲ E		
				L 0					▲	E	▲	E		▲	▲ E		
				L 0					▲	E	▲	E		▲	▲ E		
				L 0					▲	E	▲	E		▲	▲ E		
				L 0					▲	E	▲	E		▲	▲ E		
				L 0					▲	E	▲	E		▲	▲ E		
				L 0					▲	E	▲	E		▲	▲ E		
				L 0					▲	E	▲	E		▲	▲ E		
				L 0					▲	E	▲	E		▲	▲ E		
				L 0					▲	E	▲	E		▲	▲ E		
				L 0					▲	E	▲	E		▲	▲ E		
				L 0					▲	E	▲	E		▲	▲ E		
				L 0					▲	E	▲	E		▲	▲ E		

L - INORGANIC ANALYSIS/NON-LEVEL 1 ORGANIC ANALYSIS COMMENTS

Test Series No. (1–6)	Stream No. (7–8)	Test ID No. (9–11)	Smpl. No. (12–13)	Card No. (14–15)	Component Sequence Number (16–17)	Comments as Text (18–80)
G				L 1		
G				L 2		

NOTE: When encoding data, use a Ø for alpha character and 0 for numeric zero.

Page ____ of ____

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M - LEVEL 1 ORGANIC ANALYSIS

Test Series No.	Stream No.	Test ID. No.	Smpl. No.	Card No.	Component Sequence Number	Fraction ID	TCO	Grav.	ID Type	Category/Species ID	Analytical Method	High Detection Limit ±	Low Detection Limit ±	Detection Limit Units	Intensity	Actual Source Concentration (µg/m³) ±
1 2 3 4 5 6	7 8	9 10 11	12 13	14 15	16 17	18 19 20	21 22 23 24 25 26	27 28 29 30 31 32	33	34 35 36 37 38 39 40 41 42 43	44 45	46 47 48 49 50 51 52 53	54 55 56 57 58 59 60 61	62 63 64 65 66 67 68 69	70 71 72	73 74 75 76 77 78 79 80
G				M 0			▲	▲	M			▲ E	▲ E			▲ E
				M 0			▲	▲	M			▲ E	▲ E			▲ E
				M 0			▲	▲	M			▲ E	▲ E			▲ E
				M 0			▲	▲	M			▲ E	▲ E			▲ E
				M 0			▲	▲	M			▲ E	▲ E			▲ E
				M 0			▲	▲	M			▲ E	▲ E			▲ E
				M 0			▲	▲	M			▲ E	▲ E			▲ E
				M 0			▲	▲	M			▲ E	▲ E			▲ E
				M 0			▲	▲	M			▲ E	▲ E			▲ E
				M 0			▲	▲	M			▲ E	▲ E			▲ E
				M 0			▲	▲	M			▲ E	▲ E			▲ E
				M 0			▲	▲	M			▲ E	▲ E			▲ E
				M 0			▲	▲	M			▲ E	▲ E			▲ E
				M 0			▲	▲	M			▲ E	▲ E			▲ E
				M 0			▲	▲	M			▲ E	▲ E			▲ E
				M 0			▲	▲	M			▲ E	▲ E			▲ E
				M 0			▲	▲	M			▲ E	▲ E			▲ E
				M 0			▲	▲	M			▲ E	▲ E			▲ E
				M 0			▲	▲	M			▲ E	▲ E			▲ E
				M 0			▲	▲	M			▲ E	▲ E			▲ E
				M 0			▲	▲	M			▲ E	▲ E			▲ E
				M 0			▲	▲	M			▲ E	▲ E			▲ E
				M 0			▲	▲	M			▲ E	▲ E			▲ E
				M 0			▲	▲	M			▲ E	▲ E			▲ E
				M 0			▲	▲	M			▲ E	▲ E			▲ E
				M 0			▲	▲	M			▲ E	▲ E			▲ E
				M 0			▲	▲	M			▲ E	▲ E			▲ E
				M 0			▲	▲	M			▲ E	▲ E			▲ E
				M 0			▲	▲	M			▲ E	▲ E			▲ E
				M 0			▲	▲	M			▲ E	▲ E			▲ E
				M 0			▲	▲	M			▲ E	▲ E			▲ E
				M 0			▲	▲	M			▲ E	▲ E			▲ E
				M 0			▲	▲	M			▲ E	▲ E			▲ E
				M 0			▲	▲	M			▲ E	▲ E			▲ E
				M 0			▲	▲	M			▲ E	▲ E			▲ E

M - LEVEL 1 ORGANIC ANALYSIS COMMENTS

Test Series No.	Stream No.	Test ID. No.	Smpl. No.	Card No.	Component Sequence Number	Comments as Text
1 2 3 4 5 6	7 8	9 10 11	12 13	14 15	16 17	18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80
G				M 1		
G				M 2		

NOTE: When encoding data, use a Ø for alpha character and 0 for numeric zero.

Page ____ of ____

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R - RADIONUCLIDE DATA

	Test Series No.	Stream No.	Test ID. No.	Smpl. No.	Card No.	Component Sequence Number	Radionuclide ID	Analytical Method	High Detection Limit ±	Low Detection Limit ±	Detection Limit Units	Actual Source Concentration (pCi/m³) ≤ ±	
1	2 3 4 5 6	7 8	9 10 11	12 13	14 15	16 17	18 19 20 21 22 23 24 25	26 27	28 29 30 31 32 33 34 35	36 37 38 39 40 41 42 43	44 45 46 47 48 49 50 51	52 53 54 55 56 57 58 59	60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80
G					R 0				▲ E	▲ E		▲ E	
					R 0				▲ E	▲ E		▲ E	
					R 0				▲ E	▲ E		▲ E	
					R 0				▲ E	▲ E		▲ E	
					R 0				▲ E	▲ E		▲ E	
					R 0				▲ E	▲ E		▲ E	
					R 0				▲ E	▲ E		▲ E	
					R 0				▲ E	▲ E		▲ E	
					R 0				▲ E	▲ E		▲ E	
					R 0				▲ E	▲ E		▲ E	
					R 0				▲ E	▲ E		▲ E	
					R 0				▲ E	▲ E		▲ E	
					R 0				▲ E	▲ E		▲ E	
					R 0				▲ E	▲ E		▲ E	
					R 0				▲ E	▲ E		▲ E	
					R 0				▲ E	▲ E		▲ E	
					R 0				▲ E	▲ E		▲ E	
					R 0				▲ E	▲ E		▲ E	
					R 0				▲ E	▲ E		▲ E	
					R 0				▲ E	▲ E		▲ E	
					R 0				▲ E	▲ E		▲ E	
					R 0				▲ E	▲ E		▲ E	
					R 0				▲ E	▲ E		▲ E	
					R 0				▲ E	▲ E		▲ E	
					R 0				▲ E	▲ E		▲ E	
					R 0				▲ E	▲ E		▲ E	
					R 0				▲ E	▲ E		▲ E	
					R 0				▲ E	▲ E		▲ E	
					R 0				▲ E	▲ E		▲ E	
					R 0				▲ E	▲ E		▲ E	
					R 0				▲ E	▲ E		▲ E	
					R 0				▲ E	▲ E		▲ E	
					R 0				▲ E	▲ E		▲ E	
					R 0				▲ E	▲ E		▲ E	
					R 0				▲ E	▲ E		▲ E	

R - RADIONUCLIDE ANALYSIS COMMENTS

	Test Series No.	Stream No.	Test ID. No.	Smpl. No.	Card No.	Component Sequence Number	Comments as Text
1	2 3 4 5 6	7 8	9 10 11	12 13	14 15	16 17	18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80
G					R 1		
G					R 2		

NOTE: When encoding data, use a Ø for alpha character and 0 for numeric zero.

Page ____ of ____

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T - BIOASSAY DATA

Test Series No.	Stream No.	Test ID. No.	Smpl. No.	Card No.	Test Type*	Test Name*	Test Duration (Hr)	Lab. Sample ID.
1–6	7–8	9–11	12–13	14–15	16–40	41–70	71–76	77–80
G				T 0				

Card No.	Test Laboratory Name*	Lab. QA/QC Code	Test Start Mo	Test Start Da	Test Start Yr	Test End Mo	Test End Da	Test End Yr	
14–15	16–56	57–59	60–61	62–63	64–65	66–67	68–69	70–71	72–80
T 1									

Card No.	Sample Quantity	Sample Quan. Units	
14–15	16–23	24–29	30–80
T 2			

Card No.	Test Organisms/Strains*
14–15	16–80
T 3	
T 3	
T 3	

Card No.	Type of Value*	Value ±	Value Units*	High Confidence Limit ±	Low Confidence Limit ±	Maximum Applicable Dose ±	Maximum Applicable Dose Units	Level of Toxicity*	
14–15	16–19	20–26	27–34	35–41	42–48	49–56	57–65	66–79	80
T 4		E		E	E	E			

Card No.	Bacteria Mutagenicity Response*	Minimum Effective Conc. ±	Minimum Effective Conc. Units	Approximate Concentration Factor	
14–15	16–29	30–36	37–43	44–60	61–80
T 5		E			

T - BIOASSAY COMMENTS

Test Series No	Stream No.	Test ID. No	Smpl. No.	Card No.	Line No.	Comments as Text*
1–6	7–8	9–11	12–13	14–15	16–17	18–80
G				T 9		
				T 9		
				T 9		
				T 9		
				T 9		
				T 9		
				T 9		
				T 9		

*Denotes Repetitive Data Feature at Sample Level

NOTE: When encoding data, use a Ø for alpha character and 0 for numeric zero.

Page ____ of ____